January 21, 2014

Ms. Alice Truong, Contract Specialist
Metropolitan Transportation Commission
Service Authority for Freeways and Expressways
Joseph P. Bort MetroCenter
101 8th Street, 3rd Floor Receptionist
Oakland, CA 94607-4700

Re: Freeway Service Patrol Automatic Vehicle Locator System RFP, December 5, 2013

Dear Ms. Truong;

Los Alamos Technical Associates (LATA), an employee owned and operated corporation, is pleased to submit the attached proposal in response to the Freeway Service Patrol (FSP) Automatic Vehicle Locator (AVL) System RFP. Our proposal provides an understanding of the LATATrax AVL product, the modifications that will be made to meet or exceed all requirements of the RPP and the qualifications and capabilities of the LATA Team.

LATATrax is a turnkey, real-time Freeway Service Patrol AVL product, hosted on the LATA Cloud in a highly reliable and secure Tier III data center. The baseline product is in daily use with the Orange County Transportation Authority's FSP program, demonstrating its reliability and ease of use. Because the baseline LATATrax product was designed from day one to be a Freeway Service Patrol solution, the modifications required for MTC SAFE are low risk and we are able to offer our Bay Area LATATrax product at a very competitive price.

LATA (www.lata.com) was founded in 1976 in Los Alamos, NM, as a management, engineering, and technical services consulting firm and currently has annual revenues of $120,000,000. We have successfully provided a wide variety of technology services in the federal, state, and local government sectors. In the past five years LATA has developed the LATA Mobile Data System (LMDS) and LATATrax AVL products as part of our Intelligent Transportation Solutions business area. Our experience, recent investments in product development and engineering infrastructure, and proven customizable products make LATA uniquely qualified to successfully deliver the requested solutions to MTC SAFE.

LATA foresees no conflicts of interest, actual or apparent, that would hinder LATA's ability to provide the services requested in the subject RFP. LATA agrees and acknowledges all RFP specifications, terms and conditions and indicates ability to perform by submission of this proposal. LATA also acknowledges receipt of Addendum No. 1 to the RFP. This proposal is a firm offer to enter into a contract to perform work related to the subject RFP and is valid for a period of one hundred twenty (120) days from the due date of January 23, 2014.

I am the principal LATA Team contact for oral presentations, negotiations, and questions. As Vice President and Division Manager, I am authorized to solicit business and enter into contracts

for LATA. If you require additional information or clarification, please contact me at your convenience. On behalf of LATA, I express our keen interest and commitment to supporting MTC SAFE.

Sincerely,

Thomas P. O'Brien
Vice President and Division Manager
Los Alamos Technical Associates, Inc.
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Albuquerque, NM 87110
Office Direct Line 505-880-3539, Cell Phone 505-350-2121
www.lata.com
www.latatrax.org

Proposal for:
Freeway Service Patrol
Automatic Vehicle Locator System

Submitted to:
Metropolitan Transportation Commission
Service Authority for Freeways and Expressways

Submitted by:
Los Alamos Technical Associates, Inc. (LATA)
6501 Americas Parkway NE, Suite 200
Albuquerque, NM 87110
(505) 884-3800

LATA Contact: Thomas O'Brien, tobrien@lata.com

January 23, 2014

The data on the following pages of this proposal marked along the right margin with a vertical line contain technical or financial information, which are trade secrets and/or which, if disclosed, would cause substantial injury to the proposer's competitive position. The proposer requests that such data be used for review by MTC SAFE only, but understands that exemption from disclosure will be limited by MTC SAFE's obligations under the California Public Records Act. If a contract is awarded to the Proposer submitting this proposal, MTC SAFE shall have the right to use or disclose the data, unless otherwise provided by law. The pages deemed proprietary information/competition sensitive include: 11-18, 21-24, 26-27, 42, 46-48, 59-61, 69-70, 120, and 125-132.

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A. Overview and Summary

Our LATATrax team remains in place with recent experience in developing our comprehensive AVL solution. Our software and hardware are proven and currently in use. We will work closely with MTC SAFE and partner agencies to configure and customize LATATrax to make it the absolute best value solution for the San Francisco Bay Area FSP project.

We Will Customize LATATrax to Meet / Exceed All Bay Area FSP Project Requirements
• Proven – LATATrax software and hardware has been in service for over a year • Scalable – Can expand to meet MTC current and future needs for features and capacity • Reliable – Components and operations • Data Integrity & Security – Tier III data center and proven data management processes • FSP Management Tools – In place now and adding new features such as invoicing • Interoperability – ArcGIS platform enables data exchange/integration with partner agencies • FSP Analytics – Use ArcGIS Online like MTC

1. Project's Purpose

The Los Alamos Technical Associates (LATA) team is proposing LATATrax as the solution that will satisfy the requirements of the MTC SAFE AVL RFP and provide a solid foundation for future enhancements. The purpose of our development project is to develop and field a comprehensive AVL solution and service for the Bay Area Freeway Service Patrol (FSP) project that meets the goals of the MTC SAFE, CHP and Caltrans partner agencies for improving motorist safety and reducing traffic congestion in the San Francisco Bay Area. We recognize that the Bay Area FSP program and our LATATrax solution must provide effective, reliable, affordable services that meet the needs of the partner agencies and the Bay Area public as depicted in Figure A-1.

Figure A-1. Bay Area FSP Participants

We will ensure that our solution has appropriate interfaces to efficiently inform and engage all stakeholders. LATA will utilize the latest database, web and geographic information technologies to integrate and inform using the most up to date and accurate real time and historical information available. These same technologies will also enhance the ability of the partner agencies to achieve accountability for program participants and to identify areas where performance can be improved to continuously increase the Bay Area FSP project's contribution to public safety and the flow of traffic in the freeway system.

In order to meet the project goals, our Bay Area LATATrax product will provide a highly integrated approach for moving real time, administrative and historical information between tow trucks, drivers, dispatchers, CHP officers and managers. Our baseline LATATrax system has demonstrated its ability to do so, implementing a Cloud based service that provides easy access to information ranging from real time vehicle locations to historical assist performance information. The Bay Area LATATrax system will meet all RFP requirements and be an enabler for meeting FSP public safety and freeway congestion reduction goals.

2. Summary of Proposed Approach for Implementing the Project

2.1 Our Overall Approach

The LATA Team will use our LATATrax system developed for OCTA (which serves as our product baseline) as the foundation for developing the LATATrax solution that will provide the required MTC SAFE functionality and enable future upgrades. The same personnel who developed the OCTA solution are in place and immediately available to work on the Bay Area system. We have a full understanding of the baseline from which we are working and have identified where changes need to be made to be responsive to the RFP and to use this as an opportunity to implement refinements. Our technical approach is to build on the proven LATATrax baseline solution which is in use daily, configuring and customizing as necessary to meet MTC SAFE FSP requirements. This tailoring is very low risk as our LATATrax system was designed to be modular and configurable. This approach and the relative effort to modify the LATATrax baseline system are depicted in Figure A-2, which shows RFP SOW Requirements Compliance Table (RFP Appendix A SOW page 13) elements as the bottom axis.

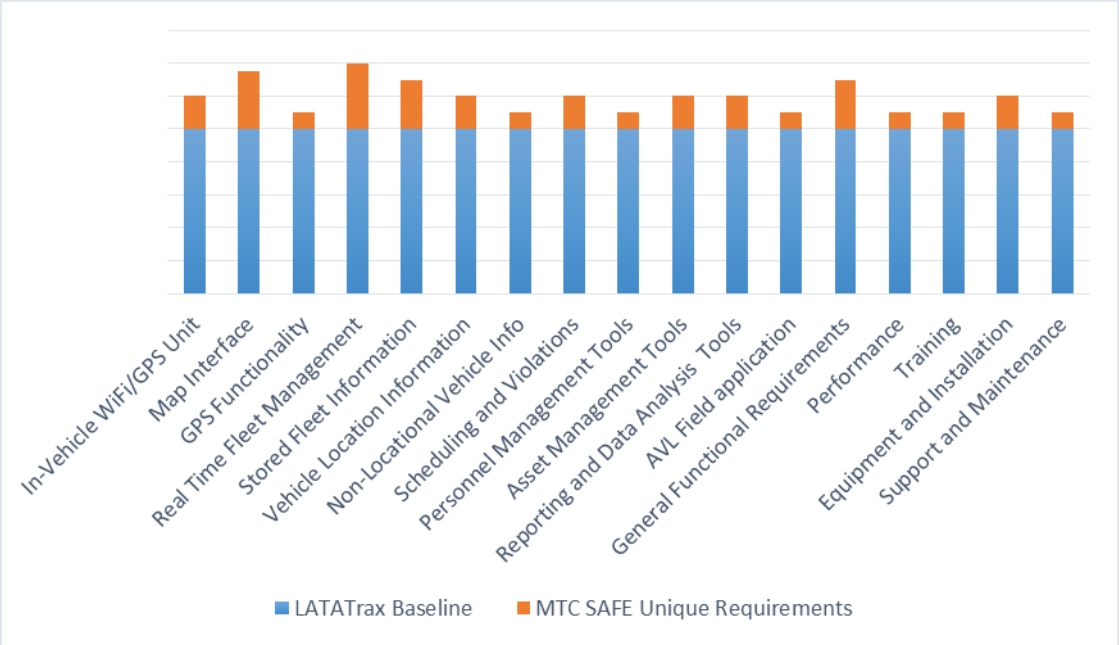

Figure A-2. Our Development Approach for Bay Area LATATrax
We will build on our baseline LATATrax, adding performance enhancements and developing and integrating the new capabilities required for the Bay Area FSP

We will use agile software development methodologies as we make configuration changes and develop the new capabilities for MTC SAFE. Our goal is to integrate changes into the baseline as efficiently as possible. Agile software development lends itself to a "build a little, test a little" approach that facilitates system integration since each of the smaller efforts are debugged in the course of incrementally implementing functionality. This approach also enables us to provide visibility to our MTC SAFE customer of the increasing system functionality as it is developed and integrated.

LATATrax for MTC SAFE will be a unique implementation of our LATATrax product, designed specifically to satisfy the requirements established in the RFP. It will include capabilities from our product baseline, but will be separately developed and managed according to its own specification, with configuration control measures implemented to enable incremental changes throughout the life of the product. We expect that each LATATrax customer will have their own requirements and preferences and our goal is to meet their specific needs rather than trying to force a "one size fits all" solution.

We will use a phased approach for implementing the various elements of the LATATrax system as required by the RFP. A similar approach was used for OCTA LATATrax with incremental testing on a limited number of vehicles prior to full scale use of the system. With our current level of system maturity, operations that work for a few trucks can be expected to work for a

large number of trucks. Our testing will focus on evaluating the performance of the new capabilities and verifying that the changes did not adversely impact our baseline capabilities.

A summary level description of the proposed LATATrax system is provided in the following paragraphs to show our understanding of the nature of the work to be performed and our general approach to AVL and information creation and sharing that is inherent to LATATrax.

Our approach is to provide a comprehensive solution hosted on our Cloud infrastructure at the Big Byte data center in Albuquerque, NM where we currently house our baseline LATATrax solution. Our Cloud infrastructure will be expanded to handle MTC FSP requirements and to ensure that OCTA and MTC SAFE data and services are properly segregated for functionality, speed and security. Using our infrastructure rather than hosting the solution on MTC servers (an option provided in the RFP) positions us to be fully accountable for system performance and to pass along cost savings for future enhancements requested by multiple FSP customers with LATATrax Cloud systems.

Our Cloud infrastructure was designed from the start to handle the needs of multiple FSP projects and will be scaled up as required to handle the Bay Area requirements. Our decision to implement the LATATrax Cloud in a highly secure and robust data center makes any required system expansions very feasible, with continued operations in a secure, Tier III data center that provides high reliability operations and protection of sensitive project information.

LATATrax will provide the proven information infrastructure needed for a highly reliable and efficient computerized communications/automatic vehicle location (AVL) communications capability for CHP dispatchers and tow truck drivers. Our operational displays and simple two way communications approach will ensure that dispatchers have the situational awareness and means to send the nearest available tow truck to quickly clear freeway lanes and help motorists with disabled vehicles.

LATATrax system components and functionality, shown in Figure A-3 will be configured for MTC SAFE users. LATATrax will incorporate additional functionality required by the RFP, yet retain the essential elements developed for OCTA since both programs share the same overall public safety and congestion relief goals. This commonality will contribute to affordability for future system enhancements that are desired by both customers. Preserving compatibility between the LATATrax variants for various users is a key aspect of our approach, as it contributes to affordability, supportability and long term value to our customers.

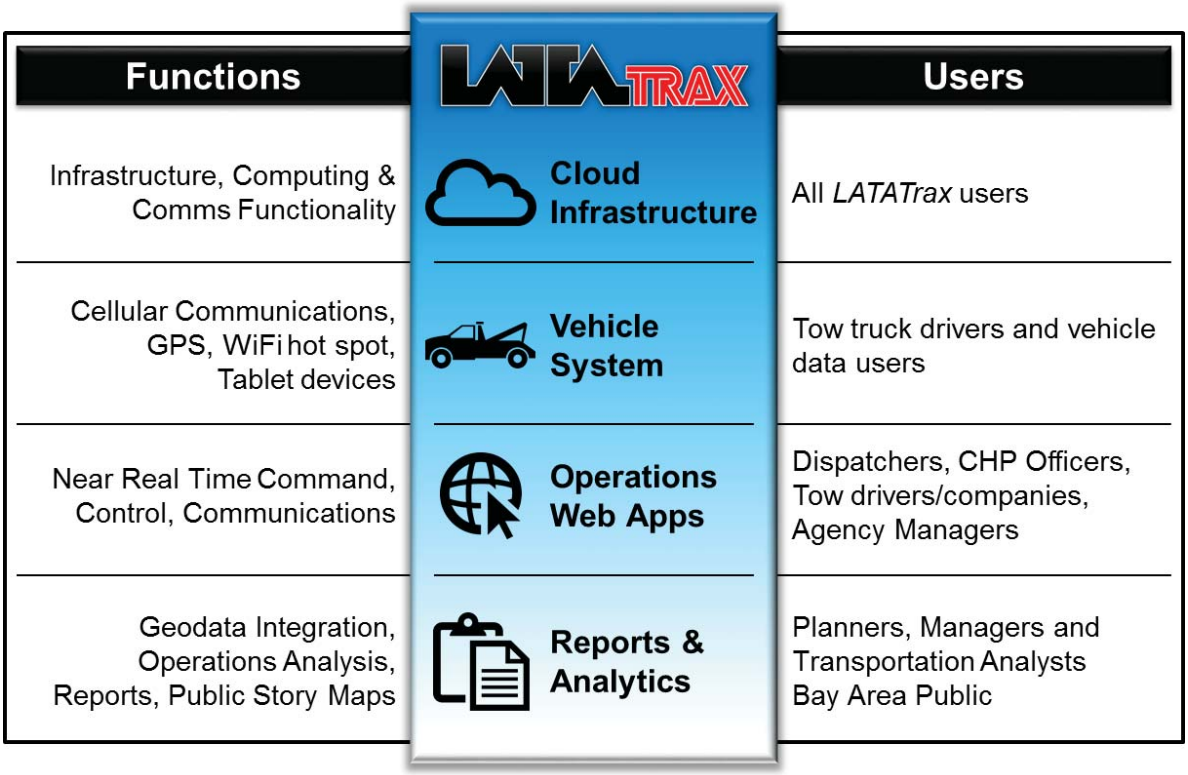
Functions
LATATRAX
Users
Infrastructure, Computing & Comms Functionality
Cloud Infrastructure
All LATATrax users
Cellular Communications, GPS, WiFi hot spot, Tablet devices
Vehicle System
Tow truck drivers and vehicle data users
Near Real Time Command, Control, Communications
Operations Web Apps
Dispatchers, CHP Officers, Tow drivers/companies, Agency Managers
Geodata Integration, Operations Analysis, Reports, Public Story Maps
Reports & Analytics
Planners, Managers and Transportation Analysts Bay Area Public

Figure A-3. LATATrax Functional View and Users
Our Baseline LATATrax system is modular and highly configurable
Enabling us to satisfy the new MTC FSP RFP Requirements

We currently utilize in-vehicle communications and GPS equipment that provides a WiFi hot spot for the tow truck driver's tablet device and connects the onboard system to a cellular network and our Cloud. This capability is being used on a daily basis in Orange County with position information being transmitted automatically and using a simple interface for the driver to communicate status and other information.

2.2 Examples of Elements of Our Approach

We will provide management tools needed to supervise FSP operations, validate invoices and evaluate the performance of the FSP project. Most of the required tools are already included in LATATrax and just need to be configured for the LATATrax data structure. New capabilities, such as invoicing, will be accomplished through fairly simple changes to our databases and display mechanisms. A sample system management screen used by dispatchers is shown Figure A-4. This interface can be modified to accommodate the preferences of Bay Area FSP users. Our system is database-driven, so we have considerable flexibility in our ability to present information. Our approach relies on sound communications with our customers to ensure that interfaces and data presented are what is needed to support management and operational

activities. The screen was designed with collaboration from OCTA dispatchers – we will use the same approach for MTC SAFE.

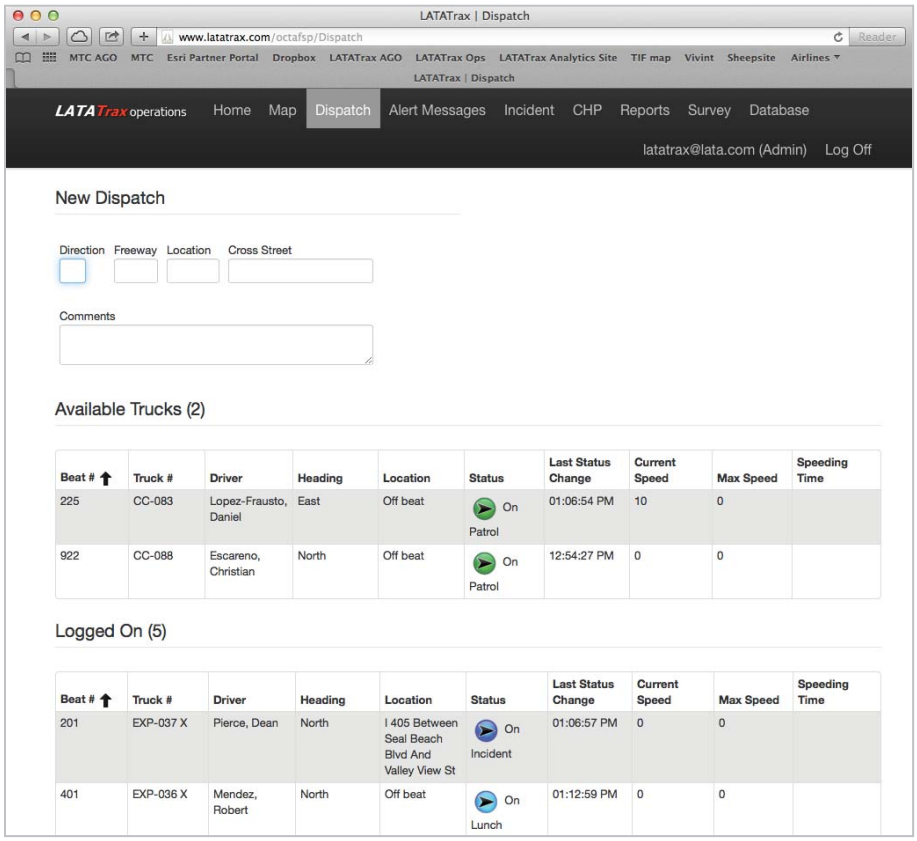

Figure A-4. LATATrax Dispatcher Screen

Our interfaces are developed with the participation of the end users to ensure ease of use and full functionality

Our proposed approach emphasizes the need for interoperability and data sharing between the partner agencies in particular to realize public safety reduced freeway congestion goals. Much of the data to be shared is location based and we are using the ArcGIS platform for sharing and integrating geographic information, such as data associated with motorist assists. ArcGIS platform elements such as ArcGIS Server and ArcGIS Online are already in use by MTC SAFE, so we expect that LATATrax will be highly compatible with investments in infrastructure and capabilities that have already been made by the partner agencies.

Bay Area LATATrax will facilitate FSP performance evaluations by providing both reports and map-based analytics using ArcGIS Online, as is the case for our baseline product. MTC currently hosts an extensive amount of geographic information (e.g., congestion data, off ramps, highway vectors) in ArcGIS Online, which can be brought into LATATrax analytics for increased

situational awareness in evaluations. An example of current LATATrax analytics in ArcGIS Online is provided in Figure A-5.

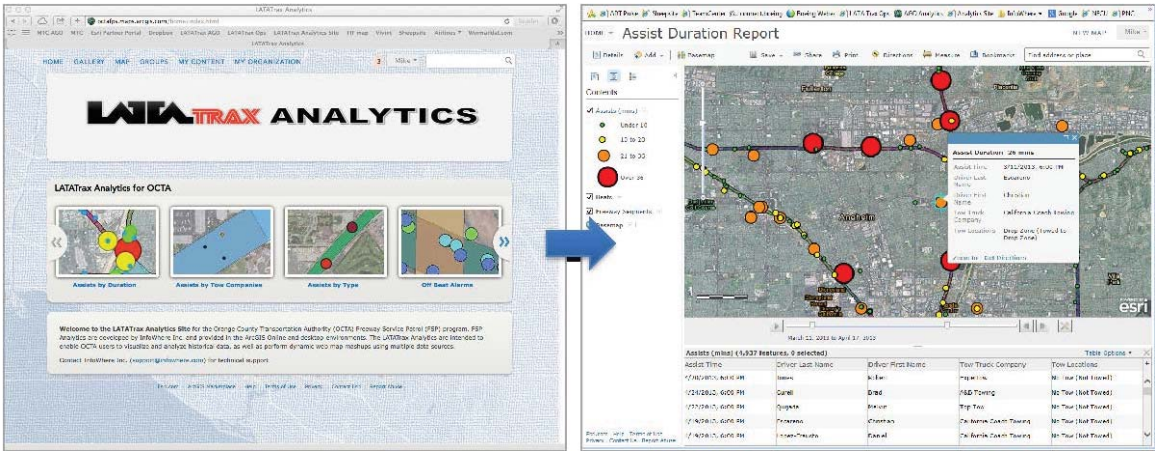

Figure A-5. LATATrax Analytics in ArcGIS Online
Both LATATrax and MTC Use ArcGIS Online as a data sharing and integration environment

The Bay Area public is an important stakeholder in the FSP project. LATATrax will engage the public and promote awareness of the value and contribution of the FSP project to reducing freeway congestion and enhancing public safety. We will modify an Esri Story Map template and build a sample Story Map incorporating FSP location data and relevant photos and videos to share the FSP success story. To do so we will use ArcGIS Online and/or an MTC selected website.

As an option to the contract, LATA will work with MTC SAFE to provide Story Maps on a monthly/periodic basis as a service. A story map example is provided in Figure A-6 to illustrate the type of information that can be shared with the public using highly interactive web maps. This approach can also be used to convey the progress of road construction projects that impact traffic flow.

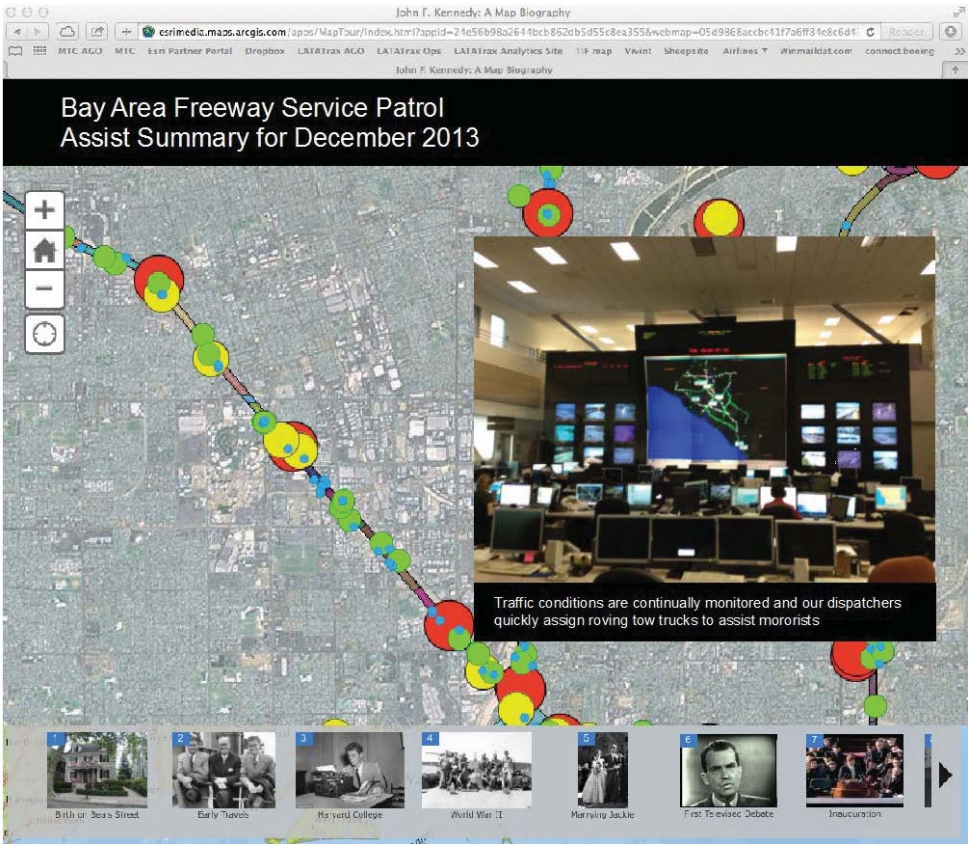
John F. Kennedy: A Map Biography
Bay Area Freeway Service Patrol
Assist Summary for December 2013
Traffic conditions are continually monitored and our dispatchers quickly assign roving tow trucks to assist mororists

Figure A-6. Public Facing FSP Monthly Story Map
This example shows the location of assists during the month of November along with photos and videos that convey the value of FSP activities for the month

3. Description of Particular Challenges

We have compared our baseline LATATrax capabilities with the requirements established by the MTC RFP and found that the systems have a very high level of commonality. Since the baseline system is in place and working well, we face few challenges in modifying the system for Bay Area FSP use. We have a clear understanding of what changes need to be made to the baseline system to meet MTC requirements, and the specifics of the challenges associated with those changes.

There are numerous changes that have to be made, which are more of a data or screen configuration nature, rather than developing new capabilities from scratch. Those changes are not considered challenges – they merely require time and attention to detail. Challenges due to complexity or being new to LATATrax are shown in Figure A-7, showing SOW Requirements Compliance Table paragraph references where applicable:

Challenge	Discussion
Problem Areas	
AVL field application store and forward *(SOW Requirements Compliance Table paragraph 1.1.6.2)*	This is a new requirement for LATATrax. Currently the location and driver initiated information is stored and transmitted to the LATATrax Cloud on a send/then forget basis without waiting for receipt confirmation from the Cloud. We will need to provide a means of automatic forwarding of stored events due to connectivity loss at the telecommunications level. We have analyzed several viable alternatives.
Advanced search functions for each table *(SOW Requirements Compliance Table paragraph 1.1.7.3.2)*	This is a new requirement for LATATrax. We currently provide access to database tables, but have limited search features. Our current plan is to expose search capabilities contained in SQL.
File Sharing within the AVL application *(SOW Requirements Compliance Table paragraph 1.1.7.7)*	This is a non-Core/non-Baseline requirement and will be a new feature in LATATrax. The main challenge will be adhering to the system's user roles and permissions feature, and ensuring that file transfer operations are isolated and do not impact performance of the near real time FSP operations functions. There are no technical obstacles.
Access of Desktop features via Web *(SOW Requirements Compliance Table paragraph 1.1.7.8)*	LATATrax currently includes 2 desktop applications: FusionWhere for FSP polygon (e.g., Beat) creation/editing, Data Playback app to visualize historical tow truck locations and data. These will also need to be implemented as web apps. FusionWhere will be implemented as an ArcGIS Online Tool Kit Map exchanging information with our ArcGIS Server and geodatabase. Playback will be implemented in ArcGIS Online, as we are already displaying historical analytical information in ArcGIS Online (e.g., Assist Durations)
Future VoIP Compatibility *(SOW Requirements Compliance Table paragraph 1.2.1.4)*	The intent is to use VoIP via the vehicle WiFi as a backup to the radio system. We have experience doing this and voice to text conversions for a train messaging system. We believe our current system is compatible (including use of speakers on the drivers' tablet devices
Scheduling Issues	
Access to test vehicles	We will need access to one or more of each FSP vehicle type to physically install equipment in the tow trucks, and to configure the equipment and test communications via the cellular network with our Cloud. This will require coordination with MTC SAFE and the tow truck contractors. We will communicate the desired installation schedule well in advance to facilitate scheduling the down time for the vehicles.

Discussions for defining the freeway beats and segments	We will need detailed discussion with MTC SAFE to define the segments and descriptions preferred by the Bay Area dispatchers. Also a first cut at beats and schedules is needed. Our team will build the required GIS infrastructure, but need inputs from MTC SAFE and partner agencies to ensure maximum compatibility with existing systems and solutions. Our team has spreadsheets that can be filled in for capturing the required data or we can use existing data in whatever form is available. The main need is to identify POCs at the beginning of the contract, as setting up the GIS infrastructure is foundational to LATATrax.
LATATrax development team availability	We have coordinated internally and have resolved schedule conflicts for our personnel. We have surge capabilities should it be necessary to develop other FSP solutions for other customers during the timeframe that the Bay Area LATATrax is in development or test phases.
Timely Completion Obstacles	
Vehicle hardware issues or failures	We have experience with the hardware being proposed for the tow vehicles and an excellent working relationship with the manufacturer. We have proven that we can quickly resolve hardware problems. Our plan is to have adequate spare units on hand to support testing and operations, so that we are not delayed by any hardware repair and return activities.
Configuring vehicles	We have developed detailed procedures for installing and configuring the in-vehicle equipment for OCTA LATATrax. We will update that material as necessary and provide training for Bay Area installers. We are using a highly qualified Disadvantaged Business Enterprise for the installation work
Operator training	Tow truck operators, FSP managers, Dispatchers and CHP Officers who will be participating in development and test activities will need training on the portion of the LATATrax system that they will be using. We provided the type of training that will be required for OCTA LATATrax participants, so we do not expect difficulties in providing the training. The main obstacle that must be addressed is consistently using people (e.g., tow truck drivers) who have received the training and are qualified to operate the system. It is important to have trained personnel so that we can distinguish system problems from people problems during system implementation.

Figure A-7. Bay Area LATATrax Challenges

We do not face significant challenges developing the Bay Area LATATrax solution due to high requirements commonality with our fielded OCTA system

We consider all of the challenges to be low risk in that they are well understood and we have identified an approach and preliminary plan for addressing each one. Since we are modifying/reconfiguring the baseline LATATrax for Bay Area use, the vast majority of the solution is already in place. This minimized the challenges because of having minimal development items that impact our overall architecture.

4. Assumptions Made in Selecting the Approach

The assumptions made by our team in selecting the approach described above are as follows:

1. We assume that MTC SAFE will want Bay Area LATATrax to be configured and managed to specifically meet current and future MTC SAFE requirements, and not be impacted by changes implemented by other LATATrax customers. To ensure that MTC SAFE will have whatever desired level of Bay Area LATATrax product configuration independence; LATA will develop a unique MTC SAFE product specification and apply appropriate configuration control measures. The Bay Area LATATrax version will be under configuration control throughout its life. We expect that there will be times when MTC SAFE and other LATATrax users will want to leverage investments in non-recurring engineering (NRE) to make the addition of new capabilities into their LATATrax version more affordable. LATA will sponsor a LATATrax User Group to facilitate communications between LATATrax Users and awareness of capabilities that have been developed. Once the NRE has been funded, other users who opt for the new feature or enhancement will only need to bear the system integration, hardware (if applicable) and support costs.
2. We assume that it will be important to the MTC partner agencies to easily share and integrate location based information such as FSP assists, PEMS, congestion, off ramp, and road repair/construction data. Transportation professionals throughout the world use Esri's ArcGIS geographic information system (GIS) platform for authoring, managing and sharing location based information. To enable GIS data interoperability, LATATrax does likewise. We utilize ArcGIS for Server, Desktop and Online in our current LATATrax product and will further customize our implementation for MTC SAFE.
3. We assume that over time, new requirements, such as incorporating rear and/or forward facing video cameras in the tow trucks will be required. To make future upgrades as affordable as possible, we have selected tow truck equipment that has capabilities that exceed the minimums required by the current RFP. Our modular, Cloud-based software also facilitates the integration of new capabilities into the proposed system.

5. Offer Summary

We propose providing all Core and Non-Core items cited in the RFP for less than $800,000 with all Baseline items (Core and Non-Core) delivered in Phase II and all Non-Baseline items (Core and Non-Core) delivered in Phase III. Including all Non-Core items in our initial bid should enable MTC SAFE to apply the Task Order funding to additional Phase III activities such as migrating data from the legacy AVL system into Bay Area LATATrax or adding new capabilities such as Voice Over IP to enhance communications between dispatchers and drivers.

Proprietary Information

B. Project Concept

1. LATATrax AVL Product Description and Customization Requirements

This section describes our current LATATrax AVL product and the customization required to modify the baseline to meet or exceed all of the Appendix A Scope of Work requirements. Our baseline LATATrax product was designed and developed from the start specifically to meet the needs of SAFE programs – it ***is not*** a generic AVL system that is being adapted for FSP use.

1.1 LATATrax Description

The LATATrax product consists of four primary elements as shown in Figure B-1:

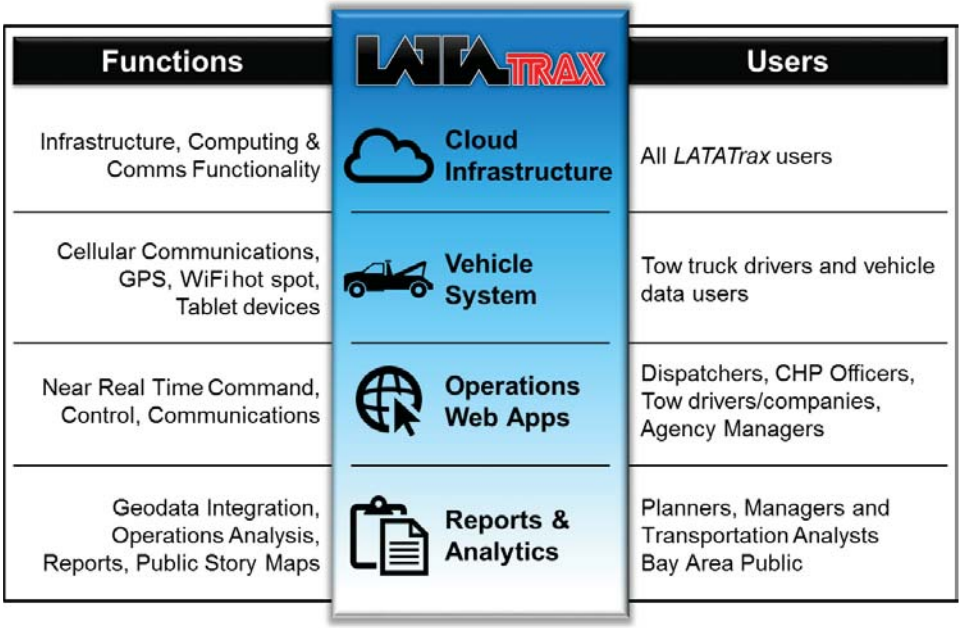
Functions
LATA TRAX
Users
Infrastructure, Computing & Comms Functionality
Cloud Infrastructure
All LATATrax users
Cellular Communications, GPS, WiFi hot spot, Tablet devices
Vehicle System
Tow truck drivers and vehicle data users
Near Real Time Command, Control, Communications
Operations Web Apps
Dispatchers, CHP Officers, Tow drivers/companies, Agency Managers
Geodata Integration, Operations Analysis, Reports, Public Story Maps
Reports & Analytics
Planners, Managers and Transportation Analysts Bay Area Public

Figure B-1 LATATrax System Summary
Our LATATrax System provides expandable FSP AVL functionality

The four primary LATATrax system elements are connected as shown in Figure B-2, which includes the interface that will be added to connect CHP dispatchers to LATATrax.

Proprietary Information

2. Requirements Compliance Table

Responses have been inserted into the spreadsheet version of the Appendix A 3.0 Requirements Compliance Table, which was downloaded from the MTC website. The pages of the spreadsheet have been copied and pasted into this section. The electronic version of the filled in spreadsheet in Excel format is available upon request.

In the Explanations column for items that are noted as PARTIAL, we have included a qualitative assessment of the percent complete for that requirement based on the capabilities of our current LATATrax system. This percentage estimate is intended to help give the proposal evaluators a sense of how much additional work is required to fully meet the requirements.

The Requirements Compliance spreadsheet pages follow:

Requirements Compliance Table					
Company: Los Alamos Technical Associates (LATA)					
No.	**Requirement**	**Core (Y/N)**	**Baseline (Y/N)**	**Compliance (full, partial, none)**	**Explanation (required for partial or no compliance)**
1.1	**Functional Requirements**				
1.1.1	***In-Vehicle WiFi/GPS Unit***				
1.1.1.1	Wireless Connectivity: The WiFi/GPS Unit used in the AVL system shall be able to transmit and receive data communications over commercial 4G or 3G networks at speeds sufficient to fulfill the system requirements and ensure functional operational communication between CHP personnel and tow drivers.	Y	Y	FULL	
1.1.1.2	GPS: The WiFi/GPS Unit shall include an embedded Global Positioning System	Y	Y	FULL	

	(GPS) device or GPS device resistant to tampering.				
1.1.1.2.1	Tracking functionality should be automatically activated when the truck is turned on and shall persist on the power from a connection to the vehicle's battery for at least 30 minutes after the vehicle is no longer running.	Y	Y	FULL	
1.1.1.3	WiFi Connectivity: The WiFi/GPS Unit shall be able to connect via WiFi with a range of commercial off the shelf tablet or Smartphone devices that shall host the tow truck driver's interface to the system.	Y	Y	FULL	
1.1.1.4	Time-out: The device shall stop drawing power from the truck's battery at a pre-defined time and/or an interval after the vehicle is no longer running, to avoid draining the truck's battery.	Y	Y	FULL	
1.1.2	***Fleet Management Tools***				
1.1.2.1	*Map Interface*				
1.1.2.1.1	Map Interface: The system must include a web-based map interface to the AVL tool.	Y	Y	FULL	

	vehicles.				
1.1.2.3.3	Alarms and Real Time Fleet Management: When in the real time fleet management mode there shall be visual and/or audible alarms to flag potential violations. Alarms can be triggered by: * Movement outside of beat borders after travel duration and/or distance specified by an authorized user. * Driver actions (e.g. log-ons, status changes) outside of the beat schedule and/or rules. * Lack of vehicle movement, after a specified duration * Lack of information from GPS device, after a specified duration * Speeding	Y	Y	FULL	
1.1.2.3.3.1	Authorized administrative users should be able to set the parameters for fleet alarms based on the schedule in 1.1.2.5.1 and the beat boundaries in 1.1.2.5.2.	Y	Y	FULL	
1.1.2.3.5	Text Messaging: Authorized system users shall be able to communicate with drivers via generic or custom text messages. Some of these messages will prompt a driver response in the form of either a Yes or	Y	Y	PARTIAL	LATATrax is at least 80% compliant with this requirement. Our current system provides a web communications interface between the drivers and the dispatchers using a tablet device with pre-configured selections (for

1.1.2.4.2.2	The system, using the same search parameters as in 1.1.2.4.2.1, shall be able to generate a table of vehicle location information (with rows representing times at an adjustable interval as low as 15 seconds) that includes the following columns:1. Date 2. Time 3. Bea t4. FSP Truck Number 5. Driver Name and Number 6. Contractor 7. Call-Sign and Shift 8. Route (Freeway) and Direction of Travel 9. Nearby Ramp 10. Latitude 11. Longitude	Y	Y	PARTIAL	This capability is 95% implemented in the Dispatch and Alert screens in our current system. We will add the Call-Sign and Shift and Nearby Ramp information. Location is shown using the segment description (e.g., SR22 Between Main and Katella), but can be displayed as Latitude/Longitude if desired.
1.1.2.4.2.3	The system shall have a playback feature that allows users to play, pause and accelerate animation of the path of a single vehicle or a group of vehicles over a user-specified time period.	N	N	FULL	
1.1.2.4.3	*Non-Locational Vehicle Information*				

1.1.2.4.3.1	Assist Tracking Table: Authorized users shall be able to view the data concerning an assist in tabular format, including the: 1. Unique ID of Assist 2. Dates/times the driver entered the incident scene 3. Dates/times the driver left the incident scene 4. Latitude and Longitude of the incident 5. Driver ID and Name 6. Contractor ID and Name 7. Beat Number 8. Call Sign Driver Used 9. FSP Truck Number 10. Assist Activity Codes 11. Odometer reading at start of incident 12. Route (Freeway) and Direction of Travel 13. Nearby Ramp 14. Highway Code (Location of Assist on Road) 15. (Push Made/Tow Made/No Push or Tow Made) 16. Assisted Vehicle Type, License Plate Number, State 17. CHP Log and Authorization Numbers 18. Driver's Notes 19. Start and End Time of that Beat Shift 20. Starting and Beginning Mileage of that Beat Shift	Y	Y	FULL	

1.1.2.4.3.1.1	Manual Input of Assist Data: Authorized system users shall be able to enter the assist information generated by the backup paper DSR forms (see Appendix 7.0). There shall be features to prevent duplicative incident data entry.	Y	Y	FULL	
1.1.2.4.3.2	Status Tracking Table: The system shall maintain an archive of the status information that a driver indicates during his or her shift. The different statuses (which are not always mutually exclusive) are listed below along with any CHP code used to describe them: 1. In Service (10-8) 2. Out of Service (10-7) 3. Off Duty (10-10) 4. En Route to Incident 5. Arrived at [Incident] Scene (10-97) 6. [Incident] Assignment Complete (10-98) 7. On Break	Y	Y	FULL	

1.1.2.4.3.2.1	The Status Tracking Table shall include the following information with regard to vehicle's status information: 1. Status' Unique ID 2. Start Time 3. Location at Start 4. End Time 5. Location at End 6. Driver 7. Call-sign/Shift 8. Vehicle Number 9. Contractor Number 10. Facilities Travelled Through During Status 11. In Beat/Out of Beat/Both 12. Time spent out of Beat 13. Unique IDs of Assists Made 14. Shortcut to a visualization of the locations travelled while the vehicle was in a particular status in the map interface.	Y	Y	PARTIAL	LATATrax is at least 95% compliant with this requirement. LATA is unsure of the meaning of item number 10. All other items are currently provided.
1.1.2.5	*Scheduling and Violations*				
1.1.2.5.1	Scheduling: The scheduling tool shall: * Allow users to view and modify the beat schedule for truck hours of service. * Allow users to approve temporary schedule changes with a specified and automatic expiration. * Allow for holiday hours of service and variations by day and seasons. * Record the base number of hours a contractor	Y	Y	PARTIAL	LATATrax is at least 80% compliant with this requirement. LATA is unsure of the last asterisk in the requirements list 1.1.2.5.1. LATATrax knows the base number of hours a contractor provides service, however the Invoicing feature will need definition and implementation.

	theoretically provides service (information to be used by the Invoicing feature in 1.1.2.5.4)				
1.1.2.5.1.1	The schedule table shall list, by beat, the associated: 1. Beat Number 2. Contractor serving the beat 3. Number of Trucks serving the beat 4. Call Signs 5. Shift 6. County 7. Routes Patrolled 8. Beat Limits 9. Beat Length 10. Start and End Dates of Beat Contract 11. Weekday Hours for AM, Midday and PM Shifts 12. Holiday Hours? 13. Weekend Beat Hours 14. Number of Trucks by Type (tow, pickup, midday, flatbed, backup) 15. Back-Up Beats (Contractors) 16. Beat Partners 17. Exceptions to Normal Schedule 18. Notes	Y	Y	PARTIAL	LATATrax is at least 70% compliant with this requirement. The Schedule tables will be expanded to include items 4, 6, 8, 9, 12, 14 - 18. It is not expected to be a significant addition to the current scheduling system.
1.1.2.5.2	Schedule and Boundary Adherence Tracking: Authorized users shall be able to draw and modify beat boundaries through the map interface. These boundaries shall sync with the official schedule to enable time-based	Y	Y	FULL	

	Geofencing to generate notices for the fleet management alarms and violations table (described in 1.1.2.3.3 and 1.1.2.5.3).				
1.1.2.5.2.1	The selected applicant shall draw the initial beat boundaries for the system, in accordance with the instructions provided by MTC SAFE	Y	Y	FULL	
1.1.2.5.3	Violations Table: The violations database shall be the central repository for all FSP violations that result in a fine. For further information on the types of violations please see Appendix A 8.0.	Y	Y	PARTIAL	LATATrax employs a violation table, however each FSP SAFE program has developed their individual sets of violation types. LATATrax only needs to populate the MTC violations into the LATATrax Database.

1.1.2.5.3.1	The Violations Table shall indicate the violation's: 1. Time/Date 2. Location (if applicable) 3. Duration (if applicable) 4. Rules Broken (see Appendix 8.0)5. Penalty*6. Contractor7. Driver (if applicable) 8. Vehicle Status at Time of violation 9. Vehicle Number (if applicable)10. Beat (if applicable) 11. Call Sign Used (if applicable) 12. Investigating Officer (if applicable)* 13. Notes (if applicable)* 14. (If applicable) A shortcut to a visual record, through the map interface, of the vehicle's location through time before, during and after the violation similar to that specified in 1.1.2.4.2.1. This feature is intended to allow the MTC fleet manager to quickly determine if a violation has in fact occurred.*See Appendix A 8.0 for further information	Y	Y	FULL	As mentioned in Explanation 1.1.2.5.3, some new data field will be required as part of final configuration of the LATATrax system. This will be performed in Phase 1 of the project.
1.1.2.5.3.2	Authorized users shall be able to manually input and modify information in the Violations Table	Y	Y	FULL	
1.1.2.5.3.3	Authorized users shall be able to flag and sort violations in the table as either false positives or genuine violations. The time and date of the last modification shall be	Y	Y	FULL	

	recorded in the database, as shall the modifying user. Unexamined violation notices shall be marked as unopened in a new violations inbox.				
1.1.2.5.4	Invoicing: The system shall auto-populate monthly invoices (see Appendix A 7.0 FSP Documents) for the tow contractors based on data in the official beat schedule and violations database. An authorized user shall be able to manually modify these invoices and save them on the system.	Y	N	NONE	LATATrax is at least 50% compliant with this requirement. All supporting data elements are collected and available, however, LATATrax at this point does not produce invoicing. It is an enhancement to LATATrax and LATA will provide this feature.
1.1.2.5.4.1	The invoicing system shall automatically generate payment invoices based on an inputted hourly rate tied to the particular tow contract and average monthly diesel price. The invoice function should auto populate the actual hours worked (including back-up service and overtime). The system should also auto populate and factor in fines for validated violations.	Y	N	NONE	LATA's response to this is as stated in 1.1.2.5.4.
1.1.2.5.4.2	Users of the invoicing system shall be able to manually edit all information in an invoice.	Y	N	NONE	LATA's response to this is as stated in 1.1.2.5.4.
1.1.2.5.4.3	There shall be a special feature to track overtime tow service (which is approved in real time by	Y	N	PARTIAL	LATATrax is at least 80% compliant. Overtime requests are captured in the Driver's log and

	CHP) by contractor, beat and driver within the invoicing system.				tracked by CHP log number, however at this time LATATrax does not produce a summarized report of overtime.
1.1.3	***Personnel Management Tools***				
1.1.3.1	Tow Contractor Table: Authorized system users shall be able to modify and/or view a table that includes tow contractor information including: 1. Contractor ID Number 2. Beat assignments 3. Back-Up Beat Assignments 4. Past beat assignments (with date ranges) 5. Period of current contract 6. Number and list of FSP drivers employed 7. Number and list of FSP trucks 8. Key Personnel with titles and contact information 9. Office Phone and Fax Numbers 10. Office Address(es) 11. Recent Commendations and Awards	Y	Y	PARTIAL	LATATrax is 80% compliant on this requirement. LATA will add items 3, 4, 6, 7, and 11 to the database and allow entry and maintained of these new data elements.

1.1.3.2	1. Driver Table: Authorized users shall be able to modify and/or view a table of FSP driver information including but not limited to: 1. Employing Tow Contractor 2. Driver Number 3. Previous Employment with FSP Tow Contractors 4. Training Completion Date 5. Violations (type and date) 6. Date of Birth 7. License Number The information record should stay with the driver even if they work for another FSP tow contractor.	Y	Y	FULL	
1.1.3.2.1	The driver table should automatically update to reflect a violation that the driver has committed and that has been validated by a user of the Violations Table in 1.1.2.5.3.	Y	Y	FULL	
1.1.3.3	Trouble Ticket System: The trouble ticket system will be used by the FSP Partners, tow contractors and maintenance providers. Users shall be able to (depending on their authorization): * Submit an online request for assistance with the FSP system and equipment * Request back-up service and track back-up services request tickets * Browse through such	Y	N	FULL	

	'trouble tickets' and comment on them * Update ticket status (resolved; unresolved; resolved-pending with notes) * Receive notification and/or copies of certain types of trouble tickets via email * Receive email reminders of unresolved or resolved-pending tickets *Search past tickets The Trouble Ticket system shall save information from validated back-up service requests for auto-population in to the Invoicing Feature (1.1.2.5.4) so that contractor's hours are deducted or added according to service provided. See Appendix A, 7.0 for the Hot Fax, Mechanical Failure and Backup Request forms, as a reference.				
1.1.4	***Asset Management Tools***				

1.1.4.1	Vehicle Table: Authorized system users shall be able to view and modify a database that includes a list of authorized FSP vehicle information including: 1. Vehicle Number 2. Tow contractor 3. Designated Beats 4. Type of vehicle (tow, pickup, flatbed, backup) 5. Current and past WiFi/GPS Units 6. VIN Number 7. License Plate Number 8. Vehicle Make 9. Vehicle Model 10. Vehicle Year 11. Date of Certification	Y	Y	PARTIAL	LATATrax is at least 90% compliant with this requirement. New data elements of items 4 and 5 will need to be added to the Vehicle Table.
1.1.4.2	WiFi/GPS Unit Table: Authorized system users shall be able to modify and/or view a database that includes: 1. WiFi/GPS Unit Unique ID 2. IP Address (if applicable) 3. Wireless provider's IDs and access information 4. Current vehicle occupied (or location information) 5. Vehicles occupied (or other location) with dates 6. Date and location of all past (de)installations 7. Installer's Notes 8. Past maintenance and repair information 9. Version of Operating System	Y	Y	PARTIAL	LATATrax is at least 90% compliant with this requirement. New data elements of items 3, 9, & 10 will need to be added to the Vehicle Table.

	10. Dates of recent Operating System upgrades				
1.1.4.3	Miscellaneous Equipment and Apparel Database: Authorized system users shall preferably be able to modify and/or view an online tool that: * Enables tow contractors to request equipment and apparel * Records the assignment of such items to tow contractors * Notes item availability and flags shortages The FSP equipment managed includes: 1. Patches 2. Hats 3. Out of Service Magnets 4. Vests 5. 4-22 forms 6. DSR Forms 7. Survey Cards 8. Brochures 9. T- Shirts	Y	N	NONE	LATATrax currently has no equipment and apparel database module. However, LATA will provide a module that performs these functions as an additional feature to the LATATrax web site.
1.1.4.3.1	The equipment system shall allow authorized users to request automatic email updates.	N	N	NONE	Please refer to explanation 1.1.4.3.
1.1.5	***Reporting and Data Analysis Tools***				
1.1.5.1	Data Manipulation/Visualization: The system shall have tools to provide summary statistics of tabular data.	Y	Y	FULL	
1.1.5.1.1	The system shall have tools to visualize tabular data in charts or graphics.	N	N	FULL	

1.1.5.2	Report Generation: There shall be an interface to generate and transmit standard and/or customized reports on all tabular information to system users either on a one-time or periodic basis. Examples of these reports may include: * Periodic reports to tow contractors with their listed violations and summary statistics on their reported assists. * Periodic reports to authorized users with summary statistics and visualizations of system-wide assist information. * Periodic reports to authorized users with information on violations and inspections, by contractor.	Y	N	FULL	
1.1.6	***AVL Field Application***				
1.1.6.1	Operating System: The field application used to access the AVL will preferably be able to run on recent versions of both the Android OS and Apple iOS and on at least on one of these two platforms.	Y	Y	FULL	

1.1.6.3.1	Driver Screen: At a minimum the driver interface must include: * An initial sign-on screen (see 1.1.6.3.1.1 for Authentication) * Easily accessible buttons to toggle the vehicle's work status ("On Break" or "En Route"). * A feature to respond to text dispatches with numerical or Y/N answers. *An incident reporting feature containing the information included in the Daily Shift Record (see Appendix 7.0 FSP Documents) in order to transmit assist data.	Y	Y	PARTIAL	LATATrax is at least 90% compliant, the system includes the required interfaces except for a feature enabling drivers to respond to text dispatches with numerical or Y/N answers. This capability will be added.
1.1.6.3.1.1	Authentication: The initial sign on screen of the driver interface shall request information to approve the log-on and properly classify information in the AVL. This information is listed below along with the requirement number for the database table in which it is contained: tow contractor number (1.1.3.1), vehicle number (1.1.4.1), driver number (1.1.3.2), CHP Area number (1.1.2.5.1.1), CHP Beat number (1.1.2.5.1.1) , the number assigned to the shift they work (1.1.2.5.1.1) and the odometer reading (no	Y	Y	FULL	

	authentication necessary). Attempts to log on that include information which is inaccurate or inconsistent with that in the database shall be denied. In addition a log-on should not authenticate if the device is connecting to the internet through any other means than through the WiFi/GPS Unit that matches the vehicle identified (information available in 1.1.4.1).				
1.1.6.3.2	Minimum Screen Size: The driver interface shall not be designed for use on standard-sized smartphones. The minimum screen size supported shall have a seven inch diagonal.	N	Y	FULL	
1.1.6.3.3	System Feedback: The driver application shall: * Inform drivers of the time they have remaining for breaks when they change their status to 'On Break,' * Confirm the system's receipt, non-receipt and/or confirmation of messages, log-on/off requests, incident reports, overtime requests and status changes. *Authorized users must have the ability to change system settings to eliminate feedback mechanisms deemed unnecessary and/or	Y	Y	FULL	

	distracting for drivers.				
1.1.7	***General Requirements***				
1.1.7.1	Unified Database: All of the information in the tables shall be stored in a single relational database. Changes made to one table should be reflected in other tables where that information is repeated.	Y	Y	FULL	
1.1.7.2	Central Portal: All of the databases and functions shall be accessible through a central web-based portal.	Y	Y	FULL	
1.1.7.3	Table Features: Tabular information shall be: * Searchable * Sort able * Filterable * Modifiable (if the user has the appropriate authorization)	Y	Y	FULL	
1.1.7.3.1	Where database information is repeated in multiple tables, users shall be able to navigate between different tables and records within the portal through the use of links within the table.	N	N	FULL	LATATrax databases are normalized and an individual data element has only one data source. Currently we only provide access to data tables through our AVL web application that consists of pre-configured screens that draw from various database tables. Direct access to appropriate system database tables will be provided with links within the tables.
1.1.7.3.2	There shall be advanced search functions for efficient querying designed for each table.	Y	Y	FULL	Advanced search functions are inherent in our databases using inherent features in SQL Server and ArcGIS Server

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					geodatabases. We have not exposed all of our tables to the user since much of the information is used for internal information processing and is not intended to be a user interface. Access to tables that are useful to FSP users along with search tools will be provided.
1.1.7.4	Administrator Tracking: Authorized users shall be able to track the data other users input in to the system and when entries occur (via timestamps on communications or a similar method).	N	N	FULL	This is incorporated in a few places for GIS data input, but not on a large scale basis. For instance when FSP polygon data is modified, the user inputs their name and any comments. The time is registered automatically. Driver inputs via tablets are registered to a particular driver during the log on process, so those data inputs are known. A full scale, automated approach could be implemented. We would want to discuss requirements in detail before doing so.
1.1.7.5	Archiving and Reset: All database information should be archived daily or twice daily with an option to reset the system to an earlier state should there be corruption or deletion of data.	Y	Y	FULL	

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	browsers of a tablet with a screen diagonal of 7 inches or larger.				and the Playback application. These are not applications that would be used by mobile personnel such as tow truck drivers or CHP Officers on patrol with a tablet.
1.1.7.9	Alert and Diagnostic Function: There shall be a tool or tools able to carry out the following functions: * Assess the integrity of a WiFi/GPS Unit or of a particular system application * Alert authorized users of large-scale problems automatically (including a system-wide shutdown) * Enable users to assess system-wide integrity * Enable authorized users to quickly ascertain where in the system repair or further troubleshooting is required.	Y	Y	FULL	
1.1.7.9.1	Information Gaps: Tables will note when data is missing and, if known, indicate why (e.g. - transmission issues, software problem, equipment failure). Also see the Diagnostic feature in 1.1.7.9.	N	Y	PARTIAL	This requirement appears to stem from a pronounced set of data corruption and loss events. Our tables note the absence of data by being blank or showing the time gaps between updates. This feature can be added via the Dashboard interface in our AVL web application.
1.1.8	***Security***				

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1.1.8.1	Internet Control: Authorized users shall be able to limit driver's access to the internet and online data through the in-vehicle WiFi network. Preferably authorized users could monitor online communications over these WiFi connections to protect against inappropriate use.	Y	Y	PARTIAL	The Driver's device as owned by the contractor is not controllable, particularly if it has cellular support, making it able to operate outside of the control of the onboard computer/router. Further the monitoring of activity is provided for by the browser on the device and cannot be controlled or monitored. LATATrax can, however, restrict access to the online computer/router to a specific internet address set.
1.1.8.2	Device Control: Authorized users shall be able to locate, deactivate and delete data on contractor-owned mobile devices designated for running the field application in tow vehicles to prevent security breaches if the devices are reported to be lost, stolen or misused. It is acceptable if this control is achieved through another application but it must be included in the bid and tested with the AVL system.	Y	Y	NONE	As mentioned in prior explanations LATATrax places no data on the Driver device owned by the contractor.
1.1.8.3	Customizable Access Privileges: MTC SAFE, as the system administrator, shall be able to assign and edit read/write privileges for different parts of the	Y	Y	FULL	

	system to users whose access is authenticated via user name and password.				
1.2	***Non-Functional Requirements***				
1.2.1	***Performance***				
1.2.1.1	Safety: The selected applicant shall design the system with the safety of mobile users and motorists as a priority. The selected applicant shall clearly explain in the AVL User Guide how mobile users shall or shall not operate its applications and equipment.	Y	Y	FULL	
1.2.1.2	Reliability: All system functions provided by the selected applicant shall have both an operational availability and accuracy of no less than 99.5% during FSP operating hours when there are no external communication or equipment issues. The Contractor will be expected to maintain the software systems to ensure this and correct any system functions not performing to this standard as soon as possible.	Y	Y	FULL	
1.2.1.3	Personal Data Security: The database will contain personal information on both the motorists assisted and FSP drivers. Security measures to protect private information shall	Y	Y	FULL	

	be consistent with the privacy policies of MTC SAFE (see IX. General Conditions, Item G, Personally Identifiable Information) as well as industry best practices.				
1.2.1.4	Future VoIP Compatibility: The system should be such that MTC SAFE could in the future install a working VoIP system through the in-vehicle WiFi, to serve as a backup to the radio system.	N	Y	FULL	
1.2.1.5	System Availability: The system provided by the selected applicant shall operate 24 hours a day, seven days a week.	Y	Y	FULL	
1.2.2	***Training Requirements***				
1.2.2.1	Training Courses: The selected applicant shall provide training that addresses the needs of all users of the AVL system, including the tow drivers, tow contractors, FSP partners, and in-vehicle equipment installer and data contractor). Elements to be included in the training include: * A demonstration and written instructions of an installation, removal and use- case scenario-based maintenance procedures for WiFi/GPS Units in a flatbed, pickup and tow truck as well as lists of the equipment needed;	Y	Y	FULL	

	* The use of the field interfaces; * The installation, use and maintenance of the AVL system, including basic and advanced features, report generation, and technical support request procedures etc.; * Technical (software/hardware) troubleshooting procedures geared toward the installer and data contractors.				
1.2.2.2	AVL User Guide: The training courses shall be complimented with an AVL User Guide. This document shall be a manual or manuals encompassing all aspects of the systems in the bid and include: * A separate description of the administrator functions in the software program * A description of how to conduct program management functions in the event of system failure (e.g.- backup paper systems) * A guide designed to help FSP Partner staff and consultants troubleshoot the AVL system *A separate manual for the field application targeted at tow operators * A codebook describing the fields in all of the	Y	Y	FULL	

	tables in the new AVL and/or FSP server's database				
1.2.3	***Equipment and Installation***				
1.2.3.1	Contractor shall provide 120 WiFi/GPS Units and all equipment needed to mount the Units in the two test fleets.		Y	FULL	
1.2.3.2	Ruggedness: The WiFi/GPS Unit and camera shall meet either MIL STD 810F or MIL STD 810G specifications. Preference will be given to units that have been tested according to the aforementioned standards for sand and dust, vibration, acoustic noise, humidity or shock.	Y	Y	FULL	
1.2.3.3	Equipment Condition: Units shall be delivered new, following standard testing procedures to assure proper working order.	Y	Y	FULL	
1.2.3.4	Compliance: Equipment intended for use within a vehicle shall operate in compliance with all applicable federal, state and local government statutes and regulations pertaining to electrically operated equipment and in-vehicle electronic devices.	Y	Y	FULL	
1.2.4	***Support and***				

	Maintenance				
1.2.4.1	Hardware Responsibility: After testing is complete WiFi/GPS units shall be installed, removed, and maintained by another firm. However failed WiFi/GPS units and accompanying equipment (modems, wires, etc.) shall be repaired/replaced by the selected applicant if initial repairs are unsuccessful. The Contractor shall be responsible for making sure there are at least 110 units in good working order and available for immediate use by FSP trucks until the end of the 5-year maintenance period unless MTC SAFE determines that the installer has not followed the written procedures provided in the Training Class.	Y	Y	FULL	
1.2.4.1.1	Items sent to the selected applicant shall be repaired and returned within 7 working days. In case of a delay, the selected applicant shall update MTC SAFE on the item's status.	Y	Y	FULL	

1.2.4.2	On-Call Installation and System Support: The selected applicant shall be ready to provide support to FSP Partners and contractors on problems with the installation or operation of the AVL system within normal business hours and return calls within day or within the next few hours of the next business day. This support shall be maintained following the installation of the system as noted in Appendix A 2.0_Project Schedule.	Y	Y	FULL	
1.2.4.2	Software Updates: All AVL software may be updated on an as-needed basis as determined by MTC SAFE via the task order process. The mobile WiFi/GPS software firmware and the AVL application shall be updated remotely via the commercial data network. The selected applicant is obligated to make sure that mobile applications remain compatible with reasonably recent, functional versions of mobile devices' operating systems.	Y	Y	FULL	

Figure B- 8. Requirements Compliance Table

Cross references to additional information on items for which LATATrax is not already fully compliant are provided in Figure B-9. Most of the information is included in the Explanation column of the Requirements Compliance Table (RCT). We propose to provide all Core and Non-Core items listed in the Requirements Compliance table and deliver all Non-Core/Non-Baseline items in Phase III, rather than deferring them to subsequent task orders.

Requirements Compliance Table Paragraph	Requirement	Core Y/N	Baseline Y/N	Delivery Phase	PARTIAL/NONE Compliance Items	Applicable Proposal Paragraphs or WBS Elements
1.1.2.1.2	Traffic Congestion display and layer toggling	N	Y	II	PARTIAL	Requirements Compliance Table (RCT) Explanation column; Section B para 6.1.1.4, 6.1.2, Section C Task Description Table, WBS 1.2.1, 1.3.3.3.1. LATATrax GIS Overview (Section A, sub-section 6.1) also applies.
1.1.2.1.5	Add, edit, toggle GIS layers	Y	Y	II	PARTIAL	RCT Explanation column; Section B para 6.1.1.4, 6.1.2, Section C Task Description Table, WBS 1.2.1, 1.3.3.3.1. LATATrax GIS Overview (Section A, sub-section 6.1) also applies
1.1.2.3.1.1	Hovering on vehicle icon to display further information	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3.3
1.1.2.3.1.2	Access real time assist info by clicking through to assist table	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3.3. LATATrax GIS Overview (Section A, sub-section 6.1) also applies
1.1.2.3.5	Text messaging to drivers	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.7.1
1.1.2.3.6	Real time AVL integration with CHP CAD	Y	Y	II	NONE	RCT Explanation column; Section C Task Description Table, WBS 1.4.4.

1.1.2.4.2.1	Playback using Map Interface	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3.1. LATATrax GIS Overview (Section A, sub-section 6.1) also applies
1.1.2.4.2.2	Playback using location table	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6
1.1.2.4.3.2.1	Status tracking table required fields	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3.5
1.1.2.5.1	Scheduling tool functionality	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3
1.1.2.5.1.1	Schedule table fields	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.1
1.1.2.5.3	Violations Table in MTC format	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.1, 1.3.3.1.2, 1.3.3.3.7
1.1.2.5.3.1	Fill in the Violations Table	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.1, 1.3.3.1.2
1.1.2.5.4	Create monthly invoices using beat schedule and violations DB	Y	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6, 3.1
1.1.2.5.4.1	Generate payment invoice using multiple variable factors	Y	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6, 3.1
1.1.2.5.4.2	Manually edit invoice info	Y	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6
1.1.2.5.4.3	Track overtime tow service	Y	N	III	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6
1.1.3.1	Tow Contractor Table data	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6
1.1.4.1	Vehicle Table data	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.6

1.1.4.2	WiFi/GPS Unit Table database	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3.2
1.1.4.3	Misc. Equipment & Apparel DB	Y	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 3.1
1.1.4.3.1	Automatic email updates function for authorized users	N	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 3.1
1.1.6.2.1	Protected data storage on contractor-provided device	N	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 3.1
1.1.6.3.1	Driver screen functional requirements	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.7.1
1.1.7.7	File sharing application integrated with the AVL	N	N	III	NONE	RCT Explanation column; Section C Task Description Table, WBS 3.1.
1.1.7.9.1	Noting information gaps in tables and indicating why	N	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.3
1.1.8.1	Internet controls to limit driver access to the Internet and data	Y	Y	II	PARTIAL	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.7.1
1.1.8.2	Device control for mobile devices	Y	Y	II	NONE	RCT Explanation column; Section C Task Description Table, WBS 1.3.3.7.1

Figure B-9. Cross References for PARTIAL and NONE Compliance Items

3. Network Configuration

The network configuration is best described both in technical and lay terms by looking at each segment from the outside of the network to the central hosting environment. Figure B-10 depicts the exterior of the network. The onboard computer produces a Local Area Network (LAN) by broadcasting a Wi-Fi hotspot. Any web enabled device can connect by selecting this broadcast and joining the network by entering a passkey. Internet access is provided like any other LAN via a service that connects through an Internet Service Provider (ISP). This service is provide via modem and a telecommunication provided (AT&T, Verizon, etc.) connection. Through standard Internet Protocol (IP) using both User Datagram Protocol (UDP) and Transmission Control Protocol (TCP) Internet access is provided. Similarly, Global Positioning System (GPS) data is captured by the onboard computer is captured via satellite stored locally and forwarded via TCP/IP over internet connections to the central hosting environment.

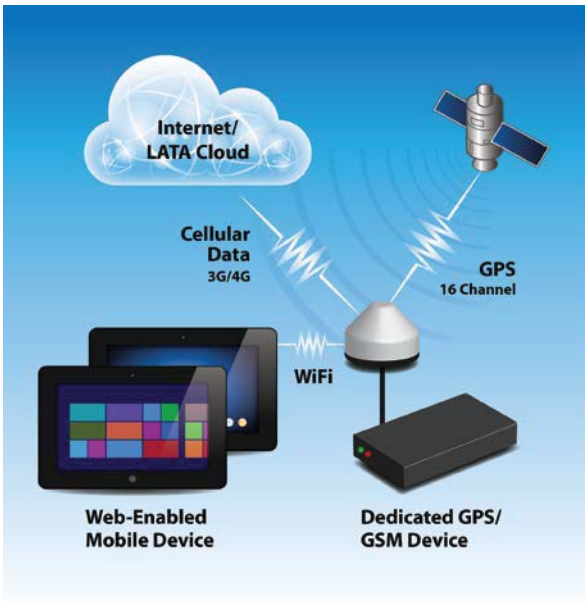


Figure B-10. Onboard Network

The utilization of the internet prevents any possible description of actual physical connections from route to route as data packets only hold a destination address and may be routed in an infinite manner. However, we can now tie in the Partners of MTC SAFE as accessing the hosting center from their controlled networks as shown in Figure B-11. Each LAN has its individual access to an ISP and via routing by their managed internet connection using destination addressing moves data to the LATA Cloud or extract data from the LATA Cloud.

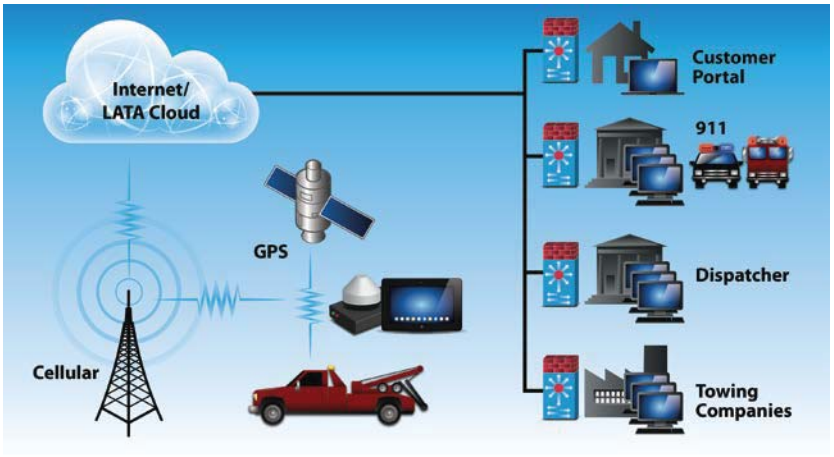


Figure B-11. LATATrax Communications

Proprietary Information

The center most configuration of the LATATrax network is depicted in Figure B-12. This portion of the network is controlled and configured by LATA and employs the Tier III hardened data center. The Cloud is sourced by two full time ISP feeds, one is provided by Cogent Communications a top tier communication provider, the second is also provided by a top tier provider, CenturyLink. Both connections operate with bursting to full gigabit band width during points of high utilization. These feeds are connected by redundant cross connected Cisco firewall devices and filtered by redundant Barracuda spam and virus devices. Both feeds are cross connected and load leveled by redundant Cisco routers. Once communications are internal to the LATA Cloud all network connections operate at four gigabit speeds.

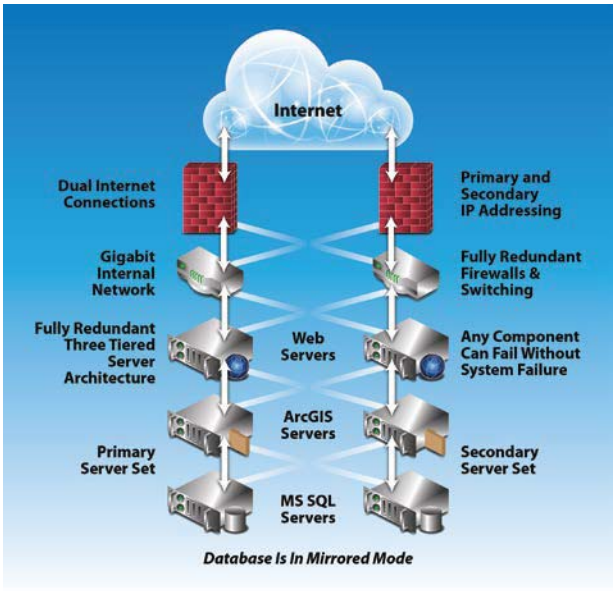


Figure B-12. LATATrax Cloud

A three tiered server architecture is employed (web servers, application servers, and database servers), which are fully redundant (at least two servers at each level). Any single server or service may fail without bringing LATATrax as a whole down to a non-functional level. Due to switching and load leveling between all servers connected to the Cloud, incoming connections are managed by one of at least 2 different web interface servers. These servers connect to at least 2 application level servers. The applications served at this level include FSP, AVL, and ArcGIS servers. These application level servers are connected to at least one primary database server with a full time active mirrored standby server in auto failover mode.

Proprietary Information

4. LATATrax Modifications and Interfaces to Meet MTC SAFE Requirements

This section identifies all aspects of the FSP system currently in use by MTC that will be replace or eliminated and where interfaces are to be built. In the Task Descriptions subsection of the Work Plan section of the proposal, descriptions of the changes needed are presented along with the WBS and Task Name to show the changes that will be made to our baseline LATATrax product to meet RFP requirements. This information, combined with the following discussion of changes to the current MTC AVL solution, provides a complete picture of changes that will be made.

"FSP Automatic Vehicle Locator System, Appendix A, Scope of Work" on Page 2 presents two options in general form. LATA elects to employ option 2, "A system that absorbs the functions of the FSP Server and interfaces with the CHP CAD." We propose to fully replace the current AVL and FSP systems with our comprehensive, integrated LATATrax product.

The Appendix A 5.0 and 6.0 demonstrate there are API(s) in place for managing the communications needed between the CHP CAD and all other components. LATA understands the use and functionality of API(s) in general and as a concept and in practice with extreme success. With this knowledge a full specification of the API in use will be required such that LATA is enabled to create the LATATrax calls to employ this API. If this information is not available LATA has the technical ability to reverse engineer the current API and replicate its functions. As the Appendix 5.0 describes the API, it can connect to the CHP CAD test system as well as the production system. All communications will be exhaustibly tested prior to any production connection. Additionally, it is expected that the technical support group for the CHP CAD will be required to properly structure networking addressing and allow all changes to the network required to support the API via the LATATrax Cloud.

Simply stated, LATA welcomes the opportunity to create and use an API interface directly with the CHP CAD system for two way communications between LATATrax and CHP CAD as depicted in Figure B-13.

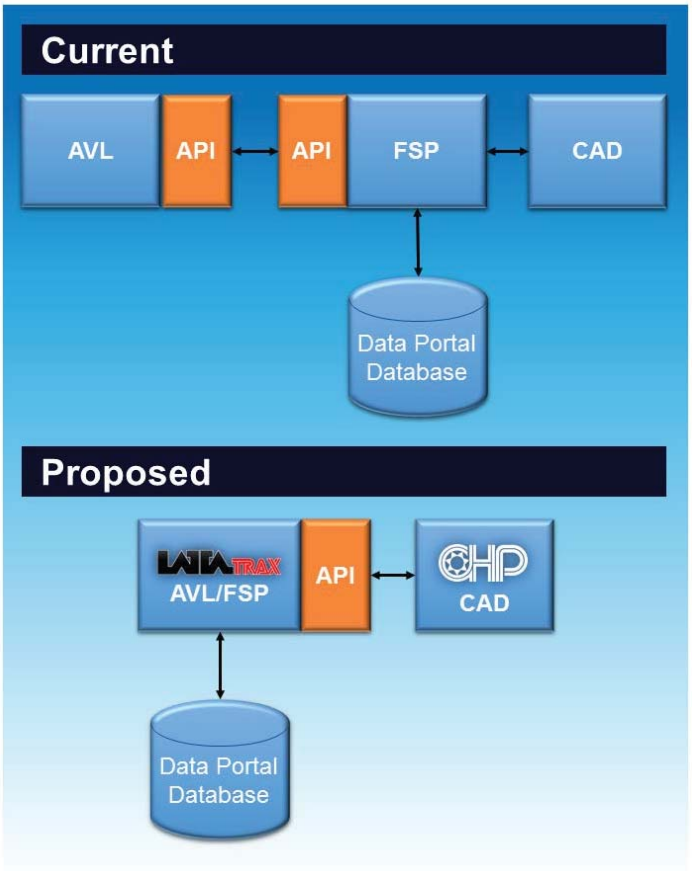


Figure B-13. LATATrax AVL Modifications

LATA will accept the existing CHP CAD supported connection described in "Appendix A 5.0: FSP Systems." The appendix describes "components consist of a firewall, router, and relay server." These connect to both a CHP CAD test and production system. LATA requires technical descriptions of the protocol used, data structure, and addressing needed to pass coded messages from LATATrax to CHP CAD and vice versa. As LATATrax is a fully hosted environment and MTC will be virtualized on the LATATrax Cloud there will be no further need for all other equipment described in Appendix A 5.0.

In terms of "Appendix A 6.0: System Interface" is concerned the AVL with its API and the FSP with its API will be replaced in totality by LATATrax and the LATATrax Cloud. A full network diagram and topology chart will be created in Phase I of the project.

5. Proposed LATATrax Sub-systems and Physical Components

LATATrax consists of four subsystems, all of which include the use of physical components as described in the following paragraphs as well as in Paragraph 3 Network Configuration. Only the Vehicle System has dedicated individual physical components for each individual vehicle.

5.1 LATATrax Cloud

The LATATrax Cloud is a method of describing a virtualized networking and computing environment that will represent the MTC SAFE environment in virtualized form. From a logical view it will appear in all ways to be individual server machines, with addresses, ports, and portals. Although no actual physical components are dedicated to supporting the MTC SAFE AVL/FSP system. However, a significant investment in hardware including servers, network gear, cabling, filters, and racking involved for this support has been made to create the appropriate virtual environment. These components are housed in a Tier III Class Hardened Datacenter (Tiers are ranked from I to IV with IV as the highest ranking).

Figure B-14. LATATrax Cloud Infrastructure

Cloud computing is the best description for the LATATrax Cloud, which is the central hosting environment we provide for the LATATrax system. Cloud computing refers to an environment that provides computer services, data storage, web application access on an ever-present basis; all accessible via what is called a portal. This environment can grow and reduce in size and does so without experiencing down time for the user community.

5.2 Operations Web Applications

All web applications are cloud based as described above. These web applications include web interfaces such as the Driver Application, Mapping Application, Dispatching Application, Driver Messaging Applications, and many more. To operate any of these web applications, a web enable computing device is require. Some smart phones have sufficient CPU, memory, and back plain capability to operate the applications, but some smart phones simply don't have the horse power to do so. Even when these resources are sufficient, viewing can be an issue pertaining to the size of the screens used. The size of icons on small screens can be so small and close together that touching a single icon accurately is difficult. Thus, it is recommended to employ a tablet device with a screen size of at least 7 diagonal inches or larger.

Some applications, such as Mapping, Historical Playback, and FusionWhere are recommended to be run from a web enabled PC machine because of the memory utilization and data streaming capabilities, such as the Microsoft Surface Pro 2. LATA has successfully run all of our LATATrax applications on both Android and iOS tablets. But best results remain as recommended.

5.3 Vehicle System

The Vehicle System is composed of the following:

- LATA employs Eurotech manufactured computers with the integral Modems, GPS system and Wi-Fi broadcast built in. This computer operates on a Linux based operating system.
- A tri-antenna supporting Wi-Fi, a cellular modem, and GPS enhancement.
- A power tamer device to support operation after the vehicle has been shut off.
- A tamper resistant enclosure.
- The modem is customer selected 3G or 4G added on to the computer, LATA recommends 3G for full area coverage. The associated data plan is MTC SAFE purchased.

5.4 Reports and Analytics

There are no physical components to this LATATrax element. Much like paragraph 5.2, Reports and Analytics are supported web based applications. These are browser based with an additional feature of downloading columnar data in an Excel spreadsheet format for individual file manipulations and calculations. Analytics are also provided using web maps in ArcGIS Online and in Excel (for users with Esri Maps for Office installed).

6. Additional explanatory materials

6.1 LATATrax Geographic Information System Overview

The LATATrax GIS design is based on the latest Web GIS technologies. Most GIS functions operate in the background without the need for User involvement once desired parameters have been set. Simple, intuitive interfaces are provided to enable User inputs with very minimal training.

Our State of the Art GIS Solution
• Easy to Use – No GIS experience needed • Proven – Leverages our OCTA solution • Scalable – Can expand to meet future needs • Reliable – Professional grade ArcGIS platform • Data Integrity & Security – Designed in • Operations Analytics – With web mash-ups

6.1.1 Functional Description

LATATrax includes numerous geospatial capabilities that leverage the latest ArcGIS platform components and custom code InfoWhere has developed for FSP applications. Our solution reflects our adoption of a Web GIS approach with most of our advanced capabilities being enabled by the use of ArcGIS Server and geodatabases. These system elements work behind the scenes to store, retrieve and process geospatial information to help us provide users with easy to use AVL web applications.

Our system includes three primary GIS functional elements:

- **FusionWhere GIS Toolbox**
  - Used to author, edit and share FSP polygons such as beats and segments
  - Currently a desktop application that will also be implemented in ArcGIS Online due to RFP requirement that desktop software also be available via the web
- **AVL Common Operating Picture (COP) web application ("Map Interface")**
  - Our near real time AVL operations web application for viewing tow truck locations, status information and alerts in a map environment. The COP is being transitioned to ArcGIS Online for the Bay Area LATATrax to enable users to have more extensive capabilities for adding other GIS layers and performing web data "mash ups".
- **Geospatial Reports & Analytics**
  - Location-centric FSP reports and analytics are hosted in ArcGIS Online with additional options for using AVL data exported to Excel and opened with Esri Maps for Office (2010 and later)
  - Customized Esri Story Map template for communicating FSP information to the public on a monthly/periodic basis using ArcGIS Online and/or MTC websites

6.1.1.1 FusionWhere – Our GIS Toolbox. Our GIS system utilizes an infrastructure of User specified "Segment" polygons to divide the freeway system into building blocks that can be combined to form User specified Beats to which tow trucks or towing companies are assigned to patrol. The Beat polygons act as "Geofences" to create alerts and status changes when the trucks move into or out of the Beat boundaries. Polygons are also used to mark the boundaries of drop zones to which disabled vehicles are towed and for tow truck yards for the companies providing FSP tow services. These fences can also be used to bound tow company's yards, physical buildings, or other geo-interesting surface features. Point features such as freeway call box locations are also included.

These features are created in FusionWhere, which is an add-in to Esri's ArcGIS Explorer software. We chose ArcGIS Explorer as the basis for our GIS Toolbox capabilities due to its simple, easy to use interfaces that do not require users to have prior GIS knowledge. An example of segments and beats along with descriptive information created using FusionWhere is presented in Figure B-15.

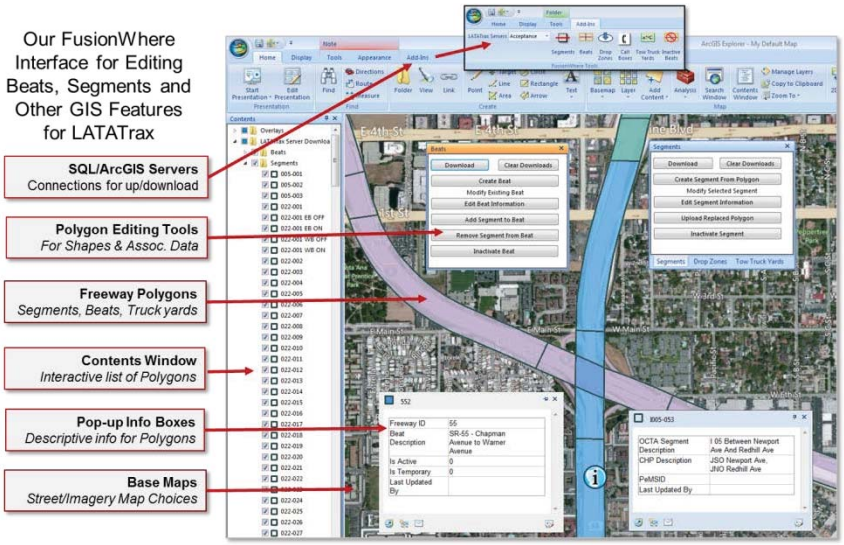


Figure B-15. Segment and Beat Infrastructure in FusionWhere
Segments provide a simple means of communicating tow truck location and Beats provide the basis for assigning tow trucks to patrol areas

6.1.1.2 AVL Common Operating Picture (COP) Web Map. Vehicle location and status (e.g., "On Assist") information is collected and displayed on the Common Operating Picture web map as shown in Figure B-16.

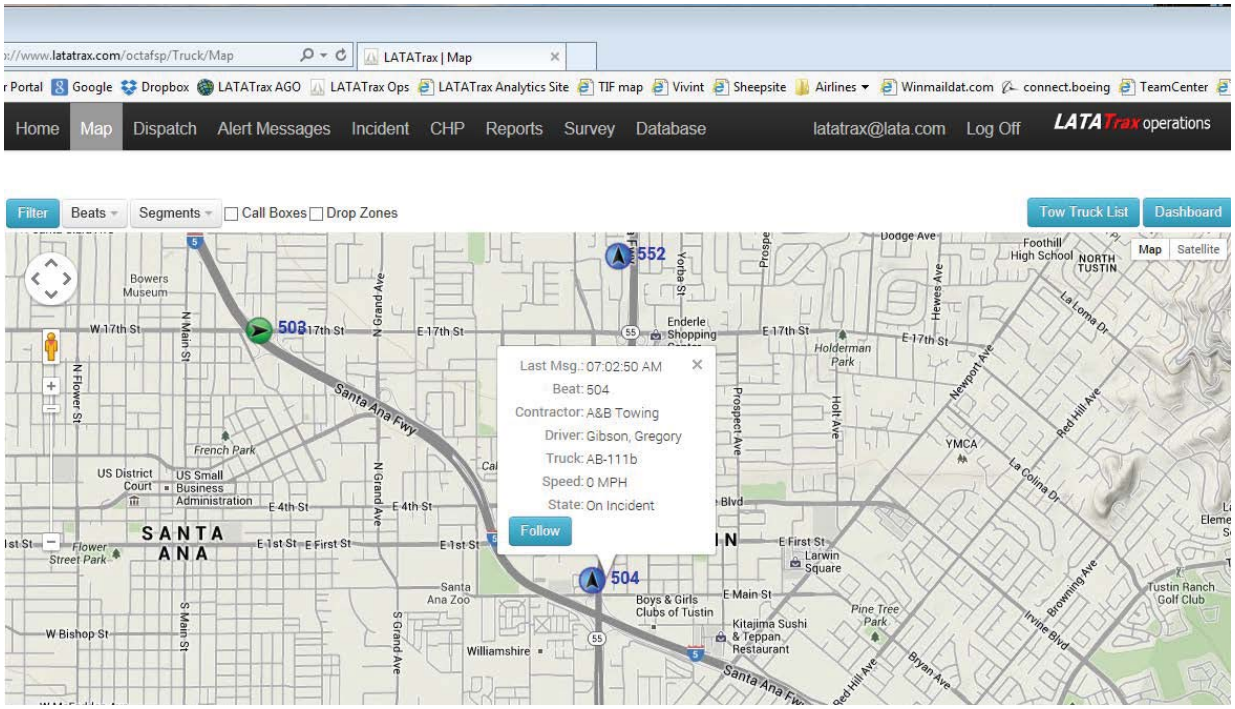


Figure B-16. LATATrax Common Operating Picture Web Map
Provides an FSP operational view and access to Operational functions

Segment and beat polygons and their descriptive information are also shown. Tow truck icons on the web map (Figure 6-2) show vehicle movement, direction, status (using colors), alerts and ancillary information. For Bay Area LATATrax the map will be hosted in an ArcGIS Online account with access controlled by MTC SAFE.

6.1.1.3 Geospatial Reports and Analytics. Our GIS solution also includes reports and analytics designed to promote operational understanding that can be used by MTC to improve the efficiency of FSP operations and also be shared with the public to heighten awareness of the value of the FSP service. The analytics are hosted in ArcGIS Online, which allows LATATrax users with appropriate permissions to share data with other MTC ArcGIS Online maps and groups.

The historical information that can be used by MTC for operational analyses is stored in a geodatabase and provided a collection of analytics maps. Our standard geospatial reports and analytics collection, as shown in Figure B-17, depicts:

- Assist Duration
- Assist Type
- Towing Summary
- Speeding Alarms

- Off Beat Alarms
- Company Assists

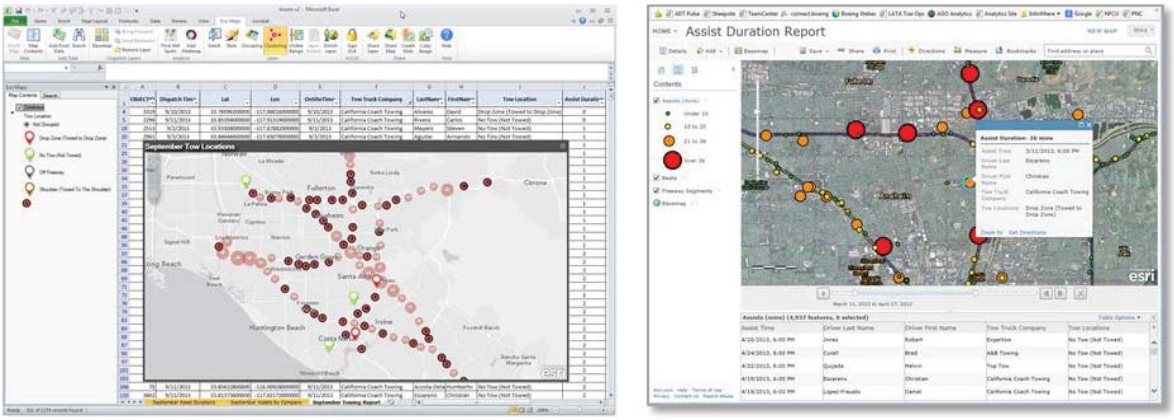


Figure B-17. Geospatial Reports & Analytics
Historical FSP performance information can be viewed in ArcGIS Online and in Microsoft Office

Information can be shared with the public (or internally within the partner agencies) using "Story Maps". LATA will create a tailored Story Map template which can hold maps, data, photos and videos to show the value of the Bay Area FSP program. Story Maps created from the template may be embedded in an MTC SAFE or partner agency web site or in an ArcGIS Online public group. For instance, a story map showing type and locations of assists for the month can be shown on the story map along with FSP related photos and/or videos. As an option, LATA can support Story Map creation on a monthly or other basis using the template.

6.1.1.4 GIS Functionality Summary. LATATrax GIS functionality and its benefits are summarized in Figure B-18.

GIS Functionality	Benefits
Creating and editing Segment polygons to define the freeways	Users can easily add Segments to define new freeway sections, or modify existing Segments
Creating and editing Beat polygons to define FSP patrol areas	Users can easily modify or delete existing Beats, and add new ones specifying active dates
Creating and editing Drop Zone polygons to define areas to drop off disabled vehicles	Users can easily modify or delete existing drop zones and add new ones
Mapping Call Box locations	Allows motorists using the call boxes to be quickly located on the map
Creating polygons to define the boundaries of tow truck yards	The tow truck yard polygons can be utilized as Geofences to provide leaving/returning alerts
Geospatial Reports & Analytics using ArcGIS Online and for the desktop in Excel	Geographic visualization of key FSP performance parameters to help improve FSP productivity
Story Maps for sharing FSP information	Polished, highly effective format for sharing FSP information with the public or other groups

C. Work Plan

LATA will use proven management and system engineering approaches for accomplishing tasks and meeting the project schedule. We stress frequent, effective communications within our team and with customer representatives and use risk management processes to identify and resolve issues early before budgets and schedules are impacted.

Our Management & Engineering Approaches Yield On Time, On Budget Results

- Frequent communications with MTC SAFE are the cornerstone of our management and solution development approaches
- We apply System Engineering processes and agile software development approaches
- Our team is experienced in working together and using LATA processes including 6 Sigma

1. How We Will Conduct the Tasks and Produce Deliverables

As discussed in the Overview and Summary Section of this proposal, our approach to conducting required tasks is to focus on the capabilities differences between our current baseline LATATrax system and what is required for MTC SAFE. The tasks to be performed to address MTC SAFE requirements not in our baseline product are addressed in detail in the Task Descriptions section of this Work Plan. The personnel who developed the functionality in the baseline version are available to develop the incremental capabilities required for MTC SAFE.

In addition to having personnel who are highly experienced in the required technical areas, we have proven managers and processes. We utilize an integrated management approach for performing IT projects and services which will allow us to accomplish the required tasks and manage deliverables for the MTC SAFE AVL project.

1.1 Integrated Management & Development Processes

As shown in Figure C-1, LATA will employ an integrated set of management and technical methods:

- The Information Technology Infrastructure Library (ITIL)
- Six Sigma define, measure, analyze, design, verify (DMADV) method of system integration and design
- “Agile” management method of product development with scrum.

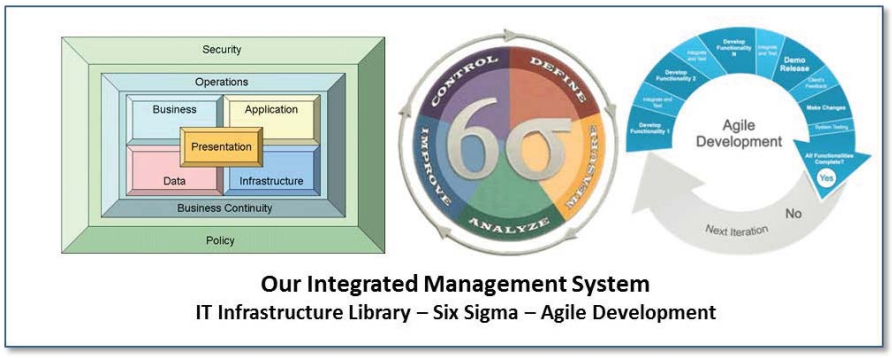


Figure C-1. LATA Management System

LATA staff holds certifications in all areas of ITIL, Six Sigma, and Agile. LATA employs these major practices for consistent and quality management within all IT projects. Additional information for these processes, which were applied to the OCTA LATATrax project, is provided in the following paragraphs.

1.1.1 Information Technology Infrastructure Library (ITIL)

ITIL gives detailed descriptions to a number of important IT practices and provides comprehensive checklists, tasks and procedures that any IT organization can tailor to its needs. It is intended to be used in an 'adopt and adapt' method, with individuals and organizations utilizing the elements of guidance which are useful, changing them to suit their specific needs, and applying the parts which are appropriate. ITIL is not a standard to be complied with; it is offered as a set of "best-practice" publications for IT service management.

The ITIL consists of six volume sets: Service Support; Service Delivery; Planning to Implement Service Management; ICT Infrastructure Management; Applications Management; and The Business Perspective. Within these, various disciplines are described. ITIL is rapidly being adopted across the world as the standard for best practice in the provisioning of IT Services. Although ITIL covers a number of areas, its main focus is certainly on IT Service Management. IT Service Management (ITSM) itself is generally divided into two main areas: Service Delivery and Service Support. Together, these two areas consist of ten disciplines that are responsible for the provision and management of effective IT services.

1.1.2 Six Sigma

As a specific corporate-wide LATA initiative integrating Six Sigma practices and education to address technical design and implementation efforts, LATA's technical and managerial staff obtained Villanova University educational certificates and industry certifications at both “Master Black Belt” and "Green Belt" levels.

The Define, Measure, Analyze, Design, and Verify (DMADV) project methodology, also known as Design for Six Sigma (DFSS) features five phases:

- *Define* design goals that are consistent with customer demands and the enterprise strategy.
- ***M**easure* and identify CTQs (characteristics that are **C**ritical **T**o **Q**uality), product capabilities, production process capability, and risks.
- ***A**nalyze* to develop and design alternatives, create a high-level design and evaluate design capability to select the best design.
- ***D**esign* details, optimize the design, and plan for design verification. This phase may require simulations.
- ***V**erify* the design, set up pilot runs, implement the production process and hand it over to the process owner(s).

1.1.3 Agile Development Methods

As a part of any IT oriented organization, special projects, products and integrations evolve that require general-purpose code development skills and management. LATA has adopted the "Agile" method to deliver these services. There are many specific agile development methods, and most promote development, teamwork, collaboration, and process adaptability throughout the life-cycle of the project. The organizing premise follows the Plan, Do, Check, and Act cyclical method of iteration. Organized experimentation follows this four-step process, also known as the Deming cycle, shown in Figure C-2.

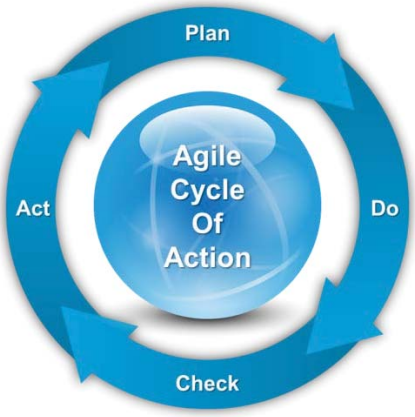


Figure C-2. The Deming Cycle
Our Implementation of Agile Processes Utilizes the Deming Cycle

We first develop a hypothesis (Plan). We then validate the hypothesis (Do) and review the results (Check). If the experiment was unsuccessful, we adjust the hypothesis (if required) and carry out another round of experimentation, either to refine the result or try a different approach (Act).

Agile methodology breaks tasks into small increments with minimal planning, and does not directly involve long-term planning. Iterations are short time frames (time boxes) that typically

last from one to four weeks. Each iteration involves a team working through a full software development cycle including planning, requirements analysis, design, coding, unit testing, and acceptance testing when a working product is demonstrated to stakeholders. This minimizes overall risk and allows the project to adapt to changes quickly. Stakeholders produce documentation as required. Iterations may not add enough functionality to warrant a market release, but the goal is to have an available release (with minimal bugs) at the end of each iteration. Multiple iterations may be required to release a product or new features.

Team composition in an agile project is usually cross-functional and self-organizing without consideration for any existing corporate hierarchy or the corporate roles of team members. Team members normally take responsibility for tasks that deliver the functionality an iteration requires. They decide individually how to meet an iteration's requirements.

Agile methods emphasize personal communication over written documents when the team is all at the same location. Most agile teams work in a single open office (called a bullpen), which facilitates such communication. Team size is typically small (5-9 people) to simplify team communication and team collaboration. Larger development efforts may be delivered by multiple teams working toward a common goal or on different parts of an effort. This may require coordination of priorities across teams. When a team works in different locations, they maintain daily contact through video conferencing, voice, e-mail, etc.

No matter what development disciplines are required, each agile team will contain a customer representative. This person is appointed by stakeholders to act on their behalf and makes a personal commitment to being available for developers to answer mid-iteration problem-domain questions. At each release iteration stakeholders and the customer representative review progress and re-evaluate priorities with a view to optimizing the return on investment and ensuring alignment with customer needs and company goals.

Most agile implementations use a routine and formal daily communication among team members. This specifically includes the customer representative and any interested stakeholders as observers. In a brief session, team members report to each other what they did the previous day, what they intend to do today, and what their roadblocks are. This communication exposes problems and facilitates prompt resolution as they arise.

Agile development emphasizes working software as the primary measure of progress. This, combined with the preference for face-to-face communication, produces less written documentation than other methods. The agile method encourages stakeholders to prioritize wants with iteration outcomes based exclusively on business value perceived at the beginning of the iteration (also known as value-driven).

Specific tools and techniques such as continuous integration, automated or x-unit test, pair programming, test driven development, design patterns, domain-driven design, code refactoring and other techniques are often used to improve quality and enhance project agility.

1.2 Draft Schedule

Our Draft Project Schedule conforms to the Phases described in the RFP and shows the timing of detailed development and testing elements of our Work Breakdown Structure (WBS). The schedule can be modified in conjunction with the project Kickoff Meeting to reflect customer discussions and clarifications. The Draft Project Schedule is provided in Figures C-3-1 through C-3-3.

WBS	Task Name	Duration	Start
1	**MTC SAFE Project**	**1652 days**	**Mon 3/3/**
1.1	**Phase I System Generation**	**210 days**	**Mon 3/3/**
1.1.1	**Project Planning and Management**	**40 days**	**Mon 3/3/**
1.1.1.1	Kickoff Meeting	0 days	Mon 3/3/
1.1.1.2	Establish Bi Weekly Project Meetings Schedule	5 days	Mon 3/3/
1.1.1.3	Project Management Plan	40 days	Mon 3/3/
1.1.2	**System Analysis**	**65 days**	**Mon 3/31**
1.1.2.1	Data Gathering To Develop Requirements	45 days	Mon 3/31
1.1.2.2	Requirements Analysis Report	20 days	Mon 3/31
1.1.2.3	**System Implementation Plan**	**40 days**	**Mon 5/5/**
1.1.2.3.1	Project Scheduling	40 days	Mon 5/5/
1.1.2.3.2	Resource Allocation	40 days	Mon 5/5/
1.1.2.3.3	Telecommunication System Modifications	40 days	Mon 5/5/
1.1.2.3.4	High-level Testing/Verification Procedures	40 days	Mon 5/5/
1.1.2.3.5	Projected Milestones for Meeting Requirements	40 days	Mon 5/5/
1.1.3	**System Development**	**130 days**	**Mon 4/7/**
1.1.3.1	System Design Report	45 days	Mon 6/30
1.1.3.2	Acceptance Test Plan	65 days	Mon 6/30
1.1.3.3	**Solution Development**	**130 days**	**Mon 4/7/**
1.1.3.3.1	**Enviroment Setup**	**130 days**	**Mon 4/7/**
1.1.3.3.1.1	Provision MTC SAFE Development, Acceptance, & Production Environments	5 days	Mon 9/29
1.1.3.3.1.2	Setup Software Devolpment Environment	125 days	Mon 4/7/
1.1.3.3.1.3	Setup Database	125 days	Mon 4/7/
1.1.3.3.1.4	Setup up Ports and Portal Connections	125 days	Mon 4/7/
1.1.3.3.1.5	Turn on Listeners	125 days	Mon 4/7/
1.3.3.1.5	Purchase and Install Needed Hardware	125 days	Mon 4/7/
1.1.3.3.1.7	In Vehicle WiFi/GPS Unit	125 days	Mon 4/7/
1.1.3.3.1.8	Run primary end-to-end system test	0 days	Mon 9/29

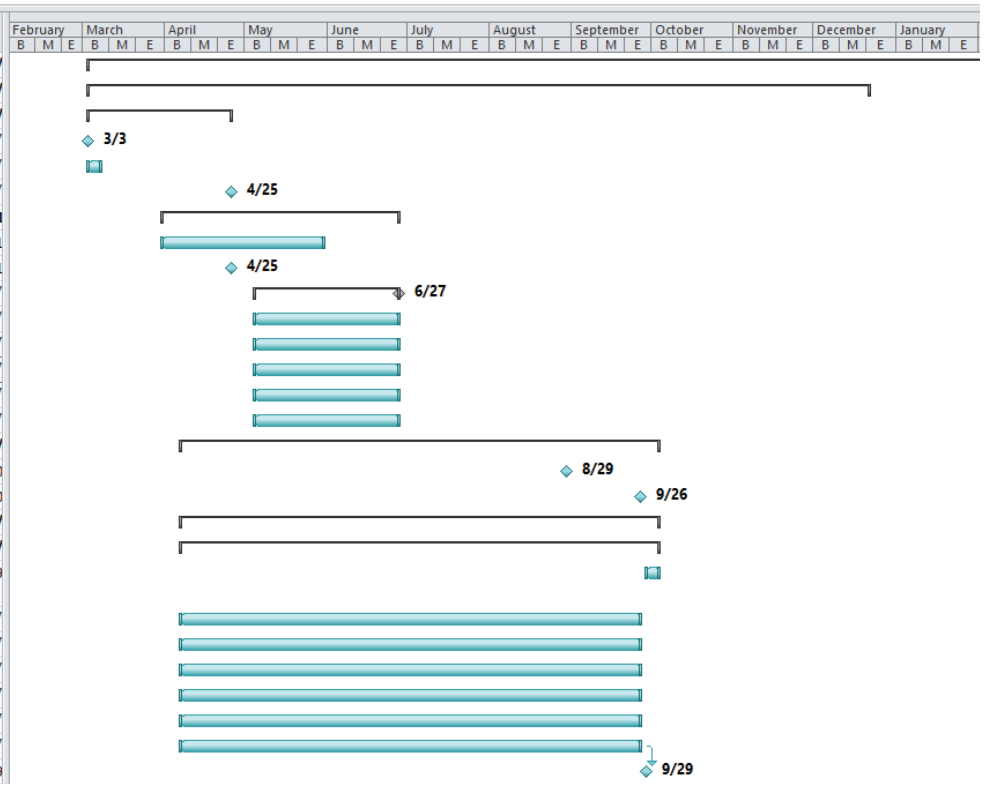


Figure C-3-1. Project Schedule Part I

WBS	Task Name	Duration	Start
1.1.3.3.1.8	Run primary end-to-end system test	0 days	Mon 9/29
1.1.3.3.2	**Fleet Management Tools**	**125 days**	**Mon 4/7/**
1.1.3.3.2.1	Map Interface	125 days	Mon 4/7/
1.3.3.3.2	GPS Functionality	125 days	Mon 4/7/
1.3.3.3.3	Real-Time Fleet Management	125 days	Mon 4/7/
1.3.3.3.4	Stored Fleet Information	125 days	Mon 4/7/
1.3.3.3.4	Vehicle Location Information	125 days	Mon 4/7/
1.3.3.3.4	Non-Locational Vehicle Information	125 days	Mon 4/7/
1.3.3.3.5	Scheduling and Violations	125 days	Mon 4/7/
1.3.3.4	Personnel Management Tools	125 days	Mon 4/7/
1.3.3.5	Asset Management Tools	125 days	Mon 4/7/
1.3.3.6	Reporting and Data Analysis Tools	125 days	Mon 4/7/
1.3.3.7	**AVL Field Application**	**125 days**	**Mon 4/7/**
1.3.3.7.1	FSP Driver Interface	125 days	Mon 4/7/
1.4	**System Integration and Test**	**185 days**	**Mon 4/7/**
1.4.1	Test AVL System	80 days	Mon 4/7/
1.4.2	Develop Test AVL Bench System	80 days	Mon 4/7/
1.4.3	Aquire Hardware for 3 trucks	40 days	Mon 5/5/
1.4.4	Test CHP CAD interface to FSP	91 days	Fri 6/27/1
1.4.5	Initial test fleet installation	21 days	Fri 10/31/
1.4.6	Draft AVL User Guide	21 days	Fri 10/31/
1.4.7	Test AVL System	36 days	Fri 10/31/
1.1.4.8	Full System operations in test mode turn up	0 days	Mon 12/2

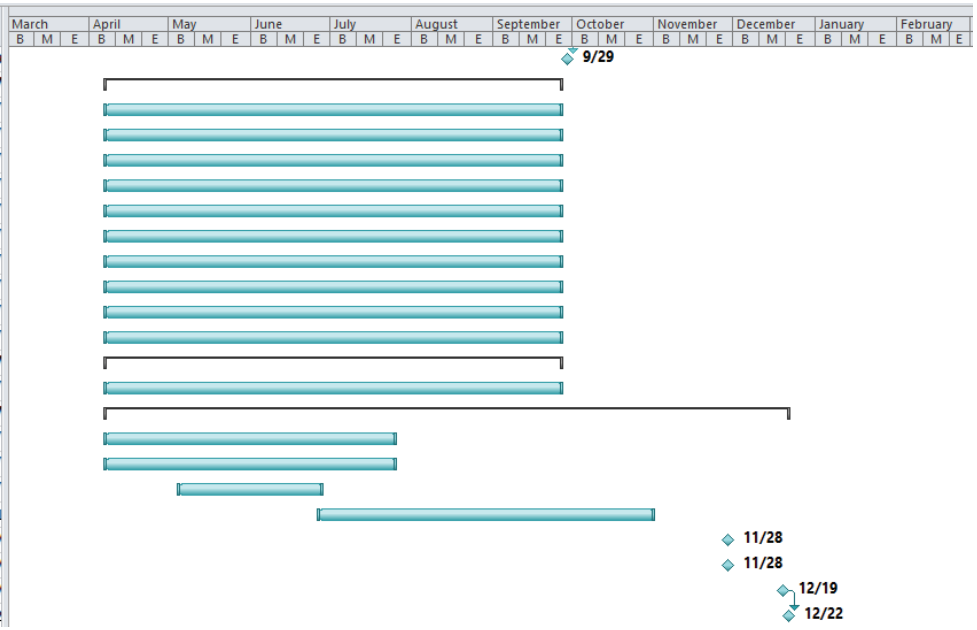


Figure C-3-2. Project Schedule Part II

WBS	Task Name	Duration	Start
1.4.7	Test AVL System	36 days	Fri 10/31/
1.1.4.8	Full System operations in test mode turn up	0 days	Mon 12/2
2	**Phase II System Delivery**	**182 days**	**Fri 12/19/**
2.1	**System Installation**	**51 days**	**Fri 12/19/**
2.1.1	Baseline AVL System	51 days	Fri 12/19/
2.1.2	Final Test Fleet Installation	51 days	Fri 12/19/
2.2	**Acceptance Testing**	**40 days**	Mon 2/2/
2.2.1	Testing	40 days	Mon 2/2/
2.2.2	Final Acceptance and System Verification Report	0 days	Fri 3/27/1
2.3	**Training**	**44 days**	**Tue 3/31/**
2.3.1	Training Plan	23 days	Tue 3/31/
2.3.2	Final AVL user guide	23 days	Tue 3/31/
2.3.3	**Training classes**	**22 days**	**Thu 4/30/**
2.3.3.1	2 - FSP Partner staff	22 days	Thu 4/30/
2.3.3.2	1 - in-vehicle maintenance providers	22 days	Thu 4/30/
2.3.3.3	1 - systems integrator	22 days	Thu 4/30/
2.4	**Final Vehicle Installation**	**67 days**	**Fri 5/29/1**
2.4.1	Obtain and Deliver equipment for balance of 120 trucks	23 days	**Fri 5/29/1**
2.4.2	Installation Support	45 days	**Tue 6/30/**
3	**Phase III System Upgrades**	**1239 days**	**Thu 10/1/**
3.1	Automatic Upgrades	1239 days	Thu 10/1/
3.2	Task Orders	1153 days	Fri 1/29/1
4	**Phase IV Operations and Maintenace**	**1240 days**	**Wed 9/3**
4.1	**Ongoing Support**	**1240 days**	**Wed 9/3**
4.1.1	On Call Technical Support	1240 days	Wed 9/3
4.1.2	Software Upgrades	1240 days	Wed 9/3

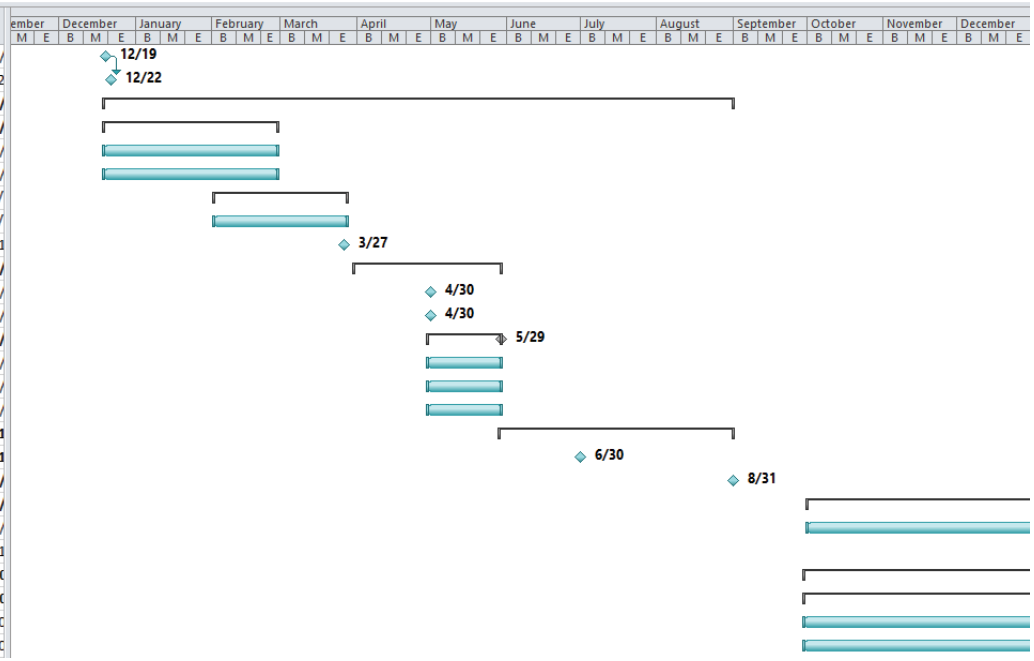


Figure C-3-3. Project Schedule Part III

1.3 Task Descriptions

WBS	Task Name	Description
1	**Phase 1 System Generation**	
1.1	Project Planning and Management	**AVL/FSP:** Develop a work structure of start and completion dates that meets the delta between current LATATrax baseline system and requirements to meet MCTSAFE requirement. **GIS:** Develop work packages with start/completion dates that meet project schedule requirements. Determine GIS data and guidance required from the customer prior to the Kickoff meeting
1.1.1	Kickoff Meeting	**AVL/FSP:** Steve Cobb will attend this meeting to begin the process of relationship building and the conveyance of understanding related to AVL/FSP problems and LATATrax solutions to those problems. **GIS:** Mike Hollis will lead the LATA contingent to the meeting and also ensure that points of contact are established for GIS matters and to discuss the GIS plan and data requirements.
1.1.2	Bi Weekly Project Meetings	**AVL/FSP:** The meetings will generally be held using WebEx due to our team being geographically distributed
1.1.3	Project Management Plan	**AVL/FSP:** Steve Cobb will provide detailed task and sub-tasks with dependencies to the MTC PM for inclusion to determine and set measurable milestones. **GIS**: Mike Hollis will provide inputs to the Project Management Plan for all GIS tasks.
1.2	System Analysis	
1.2.1	Data Gathering to Develop Requirements	**AVL/FSP:** Steve Cobb will produce specifications to enhance LATATrax according to MTC SAFE requirements and expectations; ensuring the delivery of modifications that conform to specifications avoiding misunderstandings and miscommunications. This will be done hand-in-hand with MTC stakeholders, partner agencies and project personnel. **GIS**: Mike Hollis will coordinate with customer personnel to confirm a detailed understanding of requirements and desired interfaces, and to identify preferred sources of GIS information such as Congestion data which will be reflected in the Map Interface and elsewhere. Vasu Pillalamarri will assist as needed
1.2.2	Requirements Analysis Report	**AVL/FSP:** Steve Cobb will produce a report reflecting the results of 1.2.1 efforts to be reviewed and approved as a milestone event to verify all requirements have been identified with specification documents. **GIS**: Mike Hollis will provide GIS inputs and identify any significant changes that were identified during the data gathering process.
1.2.3	System Implementation Plan	**AVL/FSP:** Steve Cobb and Mike Hollis, working with MTC stakeholders, will organize a detailed project plan addressing cost, schedule and performance considerations. **GIS**: Mike Hollis will develop detailed Implementation information for GIS tasks. The inputs will include identification of interfaces with existing CHP and MTC SAFE systems (e.g., ArcGIS Online) and associated implementation tasks.
1.2.3.1	Project Scheduling	**AVL/FSP:** Steve Cobb will accept all inputs from above tasks and produce a base line project plan for review and acceptance by MTC SAFE.

WBS	Task Name	Description
		GIS: Mike Hollis will provide scheduling inputs for GIS tasks and ensure that all project tasks are properly integrated. The Project Schedule will be maintained as a project file that will be available online.
1.2.3.2	Resource Allocation	**AVL/FSP:** Post the acceptance of the project schedule project plan, Mike Hollis and Steve Cobb will schedule and allocate resources required to meet the approved schedule and adjust the budget as necessary.
1.2.3.3	Telecommunications System Modifications	**AVL/FSP:** Steve Cobb will assist MTC SAFE in the comparison and selection of a telecommunication carrier and equipment. LATA is carrier agnostic and is solely interested in the customer's satisfaction and performance capability of selected carrier.
1.2.3.4	High Level Testing/ Verification Procedures	**AVL/FSP:** LATA employs a three-level verification process. 1) Development: all component elements are tested internally to LATA, if this level of testing is passed, component elements are advanced to 2) Acceptance: MTC SAFE and Partners involved, test against the specifications constructed and verify adherence to requirements, if this level is passed component elements are advanced to 3) Production. **GIS**: LATA will establish testing requirements for GIS elements of the system, such as ArcGIS Server, ArcGIS Online, GeoEvents Processor and Esri Operations Dashboard
1.2.3.5	Projected Milestones to Verify Requirements	Mike Hollis and Steve Cobb will provide a milestone calendar and will monitor milestones to accomplishments and progress as part of the project progress meetings. The milestones will be incorporated in the Project Schedule Microsoft Project file. The biweekly meeting schedule will be aligned with the milestone dates as appropriate. Agile software user stories and deliverable blocks of code will be associated with accomplishing the milestones.
1.3	System Development	
1.3.1	System Design Report	**AVL/FSP:** Steve Cobb will provide a detailed design report that contains all LATATrax modules, enhancements required to those modules, and new modules to be constructed as a result of all previous tasks. This design report will be the foundation document for reference as the project continues. Design will include any changes to the baseline database architecture and table formats to produce reports and interfaces required for MTC SAFE. **GIS**: LATA will provide design information for the GIS portions of the system including architecture and information interfaces between GIS and non-spatial elements, such as GIS Services broadcast by ArcGIS Server and interfaces with customer servers and data sources.
1.3.2	Acceptance Test Plan	**AVL/FSP:** As mentioned in task 1.2.3.4, the acceptance stage requires active participation by MTC SAFE and Partners to validate adherence to all specifications, system design, and testing procedures. Additionally, LATA quality assurance practices are applied as stated in "Managing Resources and Maintaining Quality Results." **GIS**: LATA will develop Acceptance Test Plans and procedures for

WBS	Task Name	Description
		GIS functions. Mike Hollis will integrate them with other LATATrax Acceptance Test Plan elements.
1.3.3	Solution Development	
1.3.3.1	Environment Setup	The hardware environment will be provisioned by a virtualized structure within the LATA Cloud environment. The results provided for delivery are a set of “URL(s)”, IT Addresses, Ports, and portal for access for MTC SAFE as all applications are browser based. All GIS requirements for hardware and software are provisioned in a single environment setup.
1.3.3.1.1	Setup Software Development Environment	**AVL/FSP:** As mentioned in 1.3.3.1 all environments are provisioned at project initialization. **GIS**: Vasu Pillalamarri will configure ArcGIS Servers in the LATATrax Cloud Production and Development environments, and will establish required ArcGIS Online groups with appropriate access restrictions by user name/role as specified by MTC.
1.3.3.1.2	Setup Database	**AVL/FSP:** Three database instances are established at the time of provisioning for development, acceptance, and production as stated in 1.3.3.1. The production database instance is mirrored on a hot standby environment in the event of any failure of the primary. **GIS**: The GIS database is also established at the time of provisioning for development, acceptance, and production as stated in 1.3.3.1.
1.3.3.1.3	Setup Ports and Portal Connections	**AVL/FSP:** The IP Addresses, Ports, and Portal are provided as an output of the provisioning stated in 1.3.3.1.
1.3.3.1.4	Turn On Listeners	**AVL/FSP:** Listeners are turned on as a final step of provisioning as stated in 1.3.3.1 and are immediately available when 1.3.3.1.3 is completed.
1.3.3.1.5	Purchase and Install Needed Hardware	**AVL/FSP:** LATA is proposing a fully hosted system and therefor no purchase or installation of hardware is required.
1.3.3.2	In Vehicle WiFi/GPS Unit	**AVL/FSP:** LATA is proposing an onboard computer/router with an add-on telecommunications modem for internet connection selected by MTC SAFE. Each modem will require a static IP Address and minimal data plan. These modems are MTC SAFE provided and must operate on a 3G network of MTC SAFE choice, LATA is provider agnostic. 4G and LTE can be used, however it is LATA experience that higher through put is available via 3G as there is lessening competition for band width as individual cellular usage flees to 4G/LTE band utilization. Additionally, an antenna and power tamer power supply are provided for the extended capability of cellular and Wi-Fi clarity of signal.
1.3.3.3	Fleet Management Tools	**AVL/FSP:** All fleet management tools are browser based (Google Chrome), using LATATrax web-enabled sites that address all requirements of Appendix A Scope of Work. This task also includes development of the scheduling tool with required functionality. It is unclear to LATA what the SOW item means by "Record the base number of hours a contractor theoretically provides service (information to be used by the Invoicing feature in 1.1.2.5.4)." This element will be specified during Phase I and may or may not require code enhancements and database changes. LATA speculated as to

WBS	Task Name	Description
		claim FULL or PARTIAL on this item due to the unclear nature of the requirement. PARTIAL was claimed as a safe statement. This task also includes incorporating an approach for noting information gaps in tables and indicating the cause of the gaps. Informational gaps in tables and files is generally the result of system failures of some kind. LATATrax has been in operation as an AVL/FSP system for over a year and in rail and other applications for more than three years. During that time we have experienced no data loss. That is not to say that MTC SAFE has requirements that would require an analytical routine to execute against critical tables and files looking for gaps. If gaps are found LATA will perform forensic studies and either eliminate the cause or repair and replace the missing data.
1.3.3.3.1	Map Interface	**AVL/FSP:** The Map Interface is currently one element of the overall LATATrax web interface. **GIS**: ArcGIS Online will be used as the Map Interface for multiple map-related requirements by performing tasks as follows: 1. The functionality of the Map Tab in the current LATATrax web application will be transitioned to ArcGIS Online to enable users to add GIS layers to the map and to modify FSP polygons such as beats using a web app instead of our FusionWhere desktop. 2. The JavaScript API will be used to add functionality such as polygon editing and geodatabase connections to ArcGIS Online. 3. ArcGIS Online maps will be created to replace the current Playback desktop app to provide the required web interface. We will use the ArcGIS JavaScript API to add the additional functionality that is not already included in our current GIS analytics that are delivered via ArcGIS Online. 4. Esri Operations Dashboard will be implemented as a web application as part of the Map Interface GUI. 5. We will configure geodatabases in the development and production environments to support GIS Services and processing. 6. GIS data provided by MTC SAFE or partner agencies will be stored or connected to ArcGIS Server and ArcGIS Online 7. Open Street Maps will be cached for the Bay Area so that a base map is available to ArcGIS Online in the event of an Esri server problem at arcgis.com to ensure that FSP operations are not impacted. 8. We will create an ArcGIS Server GIS Service that will send FSP polygon data to the LATATrax C# Portal Service and to ArcGIS Online along with near real time position data. 9. GeoEvents Processor (GEP) will be configured in ArcGIS for Server to provide on-the-fly geofencing capabilities and to do calculations such as nearest freeway exit for display on the Map Interface. The Esri Operations Dashboard is the user interface to the GEP and will be implemented as a web app in the Map Interface. 10. All required functionality will be implemented in the development environment for ArcGIS Server and in ArcGIS Online groups that are restricted to the LATATrax team and customer reviewers. Interfaces between the GIS and non-spatial components of

WBS	Task Name	Description
		LATATrax will have been developed. 11. The hover over feature is an option on the current Mapping feature that is turned on or off during the initial configuration of the LATATrax system. These specification and configuration items are discovered and documented during Phase I. Most Mapping users request it be a click on feature, due to accidental scrolling of the mouse icon causes pop up each time an icon is encountered.
1.3.3.3.2	GPS Functionality	**AVL/FSP:** GPS functionality is included in the onboard computer that is part of the Vehicle System. GPS data is transmitted to the LATATrax Cloud using the onboard cellular modem. An interface is provided to specify the polling rate of GPS. LATATrax now has a tracking table for the onboard computer and components installed as onboard equipment, however it is created and updated as units are newly installed, moved from truck to truck, or taken out of service. This table is not made available to FSP users, this modification will be specified in Phase I and implemented in Phase II.
1.3.3.3.3	Real Time Fleet Management	**AVL/FSP:** All real time fleet management tools are browser based (Google Chrome), web-enabled sites with all requirements of Appendix A Scope of Work. **GIS**: The GIS capabilities for real time fleet management will be incorporated in the LATATrax C# Portal Service and within the ArcGIS platform infrastructure and GIS Service described in the Map Interface. All required information will be captured and displayed, leveraging our non-spatial and geo databases and services. This includes hovering and click through functionality in the Map Interface.
1.3.3.3.4	Stored Fleet Information	**AVL/FSP:** LATATrax provides apps to supply the Stored Fleet Information as defined by Appendix A Scope of Work which operate on a desktop environment PC or PC Tablet. **GIS**: Our geodatabases will store all information received from the C# Service and make it accessible for analytics and playback. Our current LATATrax Analytics capability uses the geodatabase to provide the information needed (e.g., Assist Durations) for analysis of historical information in an ArcGIS Online map environment. Additional data elements will be added to the geodatabase to meet MTC SAFE requirements. Geodatabases will be accessible in both the Production and Development environments with user access as specified in the RFP.
1.3.3.3.5	Vehicle Location Information	**AVL/FSP:** The LATATrax Cloud is configured to receive, store and re-publish vehicle location information to perform multiple tracking and management functions. This task includes configuring a status tracking table. **GIS**: Vehicle location and status information is transmitted to the LATATrax Cloud and made available to the ArcGIS Servers/geodatabases via a C# Service. The location information and status information is stored in the geodatabases and provided to the Map Interface in ArcGIS Online as a service. Vehicle location is currently expressed in terms of freeway Segment descriptions and will be expanded to include lat/long, nearest exit, etc. to meet RFP

WBS	Task Name	Description
		requirements. The nearest exit will be calculated by the GeoEvents Processor using a freeway exit GIS layer (currently available on the MTC SAFE ArcGIS Online public site) and vehicle GPS data.
1.3.3.3.6	Non-Locational Vehicle Information	**AVL/FSP:** All Non-Locational Vehicle Information tools are browser based (Google Chrome), web-enabled sites with all requirements of Appendix A Scope of Work. Information will be configured to meet MTC SAFE requirements.
1.3.3.3.7	Scheduling Violations	**AVL/FSP:** Scheduling Violations are part of our current web interface and will be configured for MTC SAFE data.
1.3.3.4	Personnel Management Tools	**AVL/FSP:** The tools are in place with our current LATATrax web interface. They will be configured in the databases to work with MTC SAFE data.
1.3.3.5	Asset Management Tools	**AVL/FSP:** All Asset management tools are browser based (Google Chrome), web-enabled sites with all requirements of Appendix A Scope of Work. **GIS**: Tow truck yard boundaries will be added to the Map Interface as one of the available layers to assist in locating and managing tow trucks and any other geo-located assets. The Map Interface will include the capability for the user to select a geographic area and set geotrigger and geofence parameters for arbitrary event. This will be accomplished by incorporating an Operations Dashboard interface to the GeoEvents Processor in the Map Interface
1.3.3.6	Reporting and Data Analysis Tools	**AVL/FSP:** All Reporting and Data Analysis tools are browser based (Google Chrome), web-enabled sites with all requirements of Appendix A Scope of Work. This task includes playback using a location table. - This task includes monthly invoicing using the beat schedule and violations database and other variables. LATATrax has many of the tables and data elements that could be used in an invoicing system now. However, and Invoicing table and module does not now exist. With specification developed during Phase I and II LATA will have the understanding to compete an Invoicing module via code and database changes to the Base System. Manual editing of invoices will be included as a user feature. - Tracking overtime tow service and customizing the tow contractor table data and vehicle table data are also included. LATATrax now requires drivers to enter a CHP log number that authorizes the use of overtime in several categories. However, at this time there is no further use for the information in terms of additional processing. Overtime will be an item of specification during Phase I and II. Two new data elements, SOW requirements 4 and 5, will be added to the current Vehicle table and supporting code changes to support these fields will be specified during Phase I and associated changes, if any, deployed in Phase II.
1.3.3.7	AVL Field Applications	**AVL/FSP:** All Field Application tools are browser based (Google Chrome), web-enabled sites with all requirements of Appendix A Scope of Work.
1.3.3.7.1	FSP Driver Interface	**AVL/FSP:** All Driver Interface tools are browser based (Google Chrome), web-enabled sites with all requirements of Appendix A Scope of Work. This task includes developing text messaging to

WBS	Task Name	Description
		drivers. The Driver screen functional requirements will be defined during Phase I and all definitions will be deployed as part of the configuration process. The resulting specifications will be delivered during Phase II. This task also includes implementing controls to limit driver access to the Internet and data, and for controlling mobile devices. There are third party applications and cellular carrier application designed for this requirement. As LATA nor MTC SAFE own the device, those features would need to be created by the contractors and managed via contractual requirements between MTC SAFE and the contractor operation the device.
1.3.3.8	General Requirements	**AVL/FSP:** Due to the nature of LATATrax as a centrally hosted system all general requirements are native to the system. The database is fully normalized with all features associated with a relational database based system. Performance is scalable in every feature such as, vehicle additions, data expansion, CPU utilization, Internet speeds, network capability, etc.
1.3.3.9	Security	**AVL/FSP:** As the LATATrax system is served up from a Tier III datacenter with inherent security (physical, network, and operating systems and database). The level of security that will provided is extremely high. **GIS**: ArcGIS Online is controlled by invited members, password protected, with role limitations to protect the integrity of the system.
1.4	System Integration & Test	
1.4.1	Test AVL System	**AVL/FSP:** As discussed in provisioning 1.3.3.1 a full test system is created at project initiation and LATA will participate in ensuring MTC SAFE participation and approval of the testing environment. Additionally, LATA employs live data transferal to the testing environment to exactly emulate a production environment for accurate and complete functional testing. **GIS:** LATA will test GIS functionality and the fully integrated system, checking for connectivity, proper display of information, functionality and data storage and back up for historical purposes such as playback and analytics.
1.4.2	Develop Test AVL System	**AVL/FSP:** As discussed in provisioning 1.3.3.1 a full test system is created at project initiation and is immediately available upon environment provisioning. **GIS**: LATA will configure the GIS software for use by authorized personnel during the system integration and test phases.
1.4.3	Acquire Hardware for 3 Trucks	**AVL/FSP:** Hardware for 3 Trucks is currently available and will be deployed as the schedule and project plan requires. It is LATA experience that the sooner the trucks for the initial 3 installation are selected the hardware is installed the better; instillation should take place in concurrence with hosting provisioning to verify end-to-end communications of the environment.
1.4.4	Live Interface to CHP	**AVL/FSP:** LATA will perform all CHP CAD communication integration and testing via the test connection to the CHP CAD managed networking test environment and obtain acceptance authorization for live installation prior to initiating or installing the

WBS	Task Name	Description
		Live production interface. **GIS**: LATA will monitor testing to confirm that required GIS functionality is available and working properly.
1.4.5	Install Equipment on Trucks	**AVL/FSP:** LATA will employ a trusted sub-contractor, Wincal Technology Corporation (Wincal), to perform the initial installation of the onboard computer, antenna, and power tamer onto the 3 initial test vehicles and register those vehicles according to specification to the LATATrax AVL system, test connectivity to LATATrax, and insure the functionality of the Wi-Fi hot spot produced by the onboard computer. This will be executed from the onboard equipment installation manual provided by LATA.
1.4.6	Draft AVL User Guide	**AVL/FSP:** LATA will amend our current User's Guides to reflect all enhancements and modification specific to MTC SAFE's deployment of LATATrax. This manual will be delivered prior to training and system completion. **GIS**: A user guide will be developed for the Map Interface similar to the guide that is currently available for FusionWhere.
1.4.7	Testing	**AVL/FSP:** All testing will include use of the AVL User Guide to ensure complete coverage of the guide and complete testing of the Bay Area LATATrax implementation.
2	**Phase II System Delivery**	
2.1	System Installation	
2.1.1	Acquire Hardware for 10 Trucks	**AVL/FSP:** LATA will order and configure 10 additional onboard computers and supporting hardware for installation in 10 additional Vehicles with ample lead time for installation. This task has a dependency upon the successful acceptance of the 3 initial truck installations. At this point, MTC SAFE chosen installation and support personnel will be trained on the installation process.
2.1.2	Install Hardware	**AVL/FSP:** LATA will at this point recommend, in accordance to Appendix A Scope of Work, paragraph "Training," and use these 10 installations as field training exercises for MTC SAFE Partners.
2.2	Acceptance Testing	
2.2.1	Testing	**AVL/FSP:** LATA will make careful observation of system performance and adherence to the SOW following the Scope of Work, produce a final AVL/FSP user's guide. Additionally, LATA will review the System Verification Report for adherence. **GIS:** LATA will support Acceptance Testing as described in the System Acceptance Test Plan (requirement 1.3.2). Results will be included in the System Verification report.
2.2.2	Final Acceptance and System Verification Report	**AVL/FSP:** LATA will review and resolve any open issues in the System Verification Report and note the resolution of each item on the report as completed or otherwise satisfied. **GIS:** LATA will provide inputs to the report for the GIS elements of the system.
2.3	Training	
2.3.1	Training Plan	**AVL/FSP:** LATA will develop and produce a training plan for all MTC SAFE Stakeholders and Partners, schedule and execute training related to the Statement of Work in Appendix A Paragraph "Training." **GIS**: LATA will develop a training plan for the Map Interface and all

WBS	Task Name	Description
		GIS functionality exposed to the users.
2.3.2	Final AVL User Guide	**AVL/FSP:** It is recommended that the Final AVL User Guide be produced prior to the pervious task number 2.3.1 as it will be used in the training process and must be complete prior to that task. **GIS**: LATA will provide the GIS functionality portion of the user guide. The guide will include short video demonstrations showing how the user can perform various functions, in addition to providing written materials.
2.4	Training Classes	
2.4.1	2 – FSP Partner Staff	**AVL/FSP:** LATA will provide training of the capabilities and use of the LATATrax system. **GIS**: LATA will provide training on the GIS aspects of the Bay Area LATATrax system.
2.4.2	1 – In-Vehicle Maintenance Providers	**AVL/FSP:** LATA will ensure maintenance provider personnel receive training on all aspects of the LATATrax hardware and software needed to maintain the system in the field **GIS:** LATA will provide training on the GIS aspects of the Bay Area LATATrax system to maintenance providers if needed.
2.4.3	1 – Systems Integrator	**FSP/AVL:** System integrator training will be provided with an emphasis on LATATrax system interfaces and data structures. **GIS:** LATA will provide training on the GIS aspects of the LATATrax system.
2.5	Final Vehicle Installation	
2.5.1	Deliver Equipment for Balance of 120 Trucks	**AVL/FSP:** LATA will deliver the remaining 107 onboard equipment sets with ample time for installation into field vehicles, registration to the LATATrax system, and validation of proper functionality.
2.5.2	Temporary Support	**AVL/FSP:** 15 hours/week of support will be provided during final vehicle installations and continue for one month afterwards.
3	**Phase III System Upgrades**	
3.1	Automatic Upgrades	**AVL/FSP**: During this phase LATA will complete development and testing of all requirements that are Non-Baseline/Core items and Non-Baseline/Non-core items such as those items listed in Figure B-8 Requirements Compliance Table and Figure B-9 Cross References for Partial and None Compliance Items. These figures are located in Section B Project Concept, Sub-section 2. Development requirements for this task include: - the Miscellaneous Equipment and Apparel database - Final integration and testing for creating monthly invoices and generating payment invoices using multiple variables - Automatic email updates function for authorized users. Each requirement for automatic updates to users via email must be defined in terms of usage and requirement. LATATrax has intended to include such a module in the base system for reporting and other trigger based on user requirements. Specifications to do so for MTC SAFE will be gathered and finalized in Phase II for deployment in Phase III. - Protected data storage on contractor-provided devices. LATA does not, at this time, intend to store data on contractor provided devices. Some of the reasoning for this revolves around the reality

WBS	Task Name	Description
		that contractors are added and removed from the program, as those contractors own the devices in question there may be ownership factors concerning FSP/AVL data ownership on those devices. Hence, LATA stores data on the onboard computer that is MTC SAFE owned and installed in the contractor's truck and removed if and when the contractor exits the program. - The file sharing application. It is LATA's vision that this requirement is a result of dispersed files across multiple devices and not a result of a centralized database. LATA will carefully specify these requirements during Phase I. LATA is certain this will be provided if needed, however we do not believe this will be required as part of a fully normalized database. These are inherently database functions which will be considered at the beginning of the Bay Area LATATrax project when the database architecture is being established. **GIS**: LATA will provide upgrades to GIS elements of the system due to availability of COTS software updates, identification of software bugs or new user requirements.
3.2	Task Orders	**AVL/FSP:** LATA suggests the following task orders topics: 1) Data migration of the current FSP system data to provide for historical data retention policy. 2) Implementation of Voice Over IP to enhance communications between CHP Dispatchers and drivers
4	**Phase IV Operations and Maintenance**	
4.1	Ongoing Support	
4.1.1	On Call Technical Support	**AVL/FSP:** LATA will provide an on call number and support for the entire LATATrax system that will not be restricted to normal business hours of MTC SAFE. This support service level will be mutually developed by MTC SAFE and LATA to best meet the support needs. **GIS**: LATA will provide on call technical support for LATATrax GIS functionality.
4.1.2	Software Upgrades	**AVL/FSP:** All software upgrades will be provided to MTC SAFE in written form prior to installation into the production environment to allow acceptance of said upgrades. MTC has the option of declining upgrades that may not be appropriate in the environment and for MTC use. **GIS:** LATA will provide GIS software upgrades as required, including patches and upgrades to the ArcGIS platform components. For instance ArcGIS Server updates are part of our software Maintenance Agreement with Esri and new releases are generally available on an annual basis. Upgrades to GIS capabilities to meet new user requirements will be made by the LATA team in accordance with task order requirements. New training materials will be provided as appropriate when software upgrades are implemented as part of the task order requirements.

Figure C-4. Project Tasks

2. Organization and Staffing

2.1 Organizational Chart

The LATA Team organization is shown in Figure C-5, reflecting the roles and responsibilities of key personnel, the reporting structure and the relationships between MTC Safe, partner agencies, LATA staff and our subcontractors.

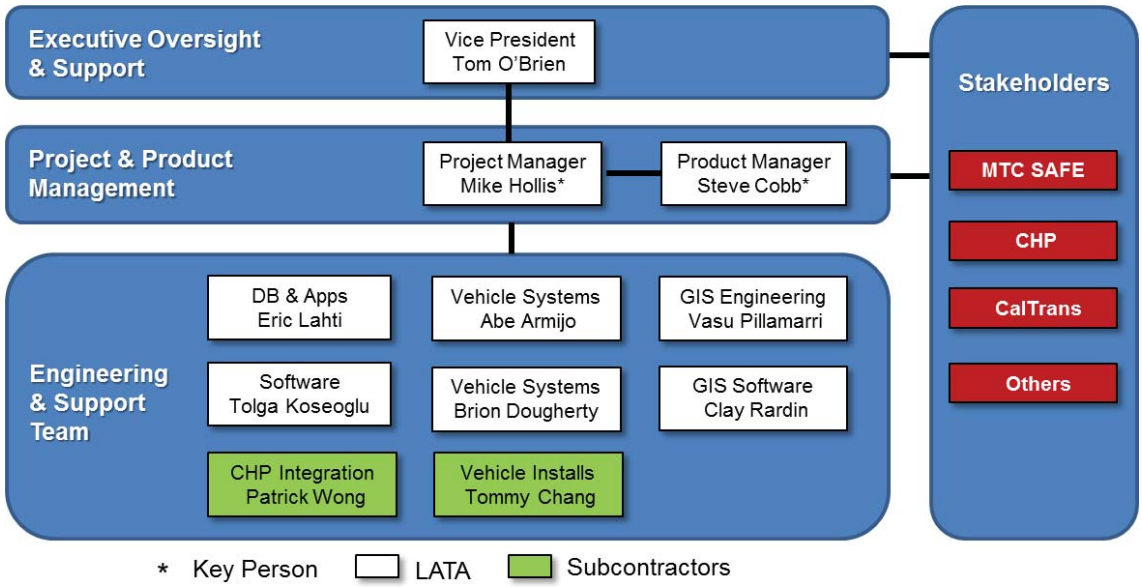


Figure C-5. Project Organization

The roles and responsibilities of the LATA and subcontractor personnel are summarized in Figure C-6.

Name	Roles & Responsibilities
Tom O'Brien	LATA Vice President, responsible for oversight of the project and periodic customer communications. Ensures LATA corporate resources are applied to resolve issues raised by the Project Manager
Mike Hollis	LATA Project Manager, responsible for managing cost, schedule, performance and risk for the entire project. Maintains frequent direct communications with MTC SAFE and partner agencies as appropriate. He continues to have LATATrax GIS technical responsibilities for (1) transition of our current Map Interface from Google Maps to ArcGIS Online with additional functionality, (2) transition of FusionWhere desktop to a web application in ArcGIS Online, (3) transitioning the Playback desktop application to a web application in ArcGIS Online, and (4) managing implementation of new GIS capabilities
Steve Cobb	LATA Product Manager for all LATATrax variants. Functions as Chief Engineer for the Bay Area LATATrax project, responsible for the design and implementation of the LATATrax solution (Cloud, Vehicle System, Ops Applications, Reports & Analytics), providing technical direction to the Engineering & Support team. Leads

Name	Roles & Responsibilities
	scrums that are key to our agile development process. Serves as the main technical POC between our team and MTC SAFE, coordinating communications with the LATA Project Manager.
Eric Lahti	As database lead, he will set up the database architecture for MTC SAFE and ensure data is normalized (unless duplication is needed for system performance). Modifies our current Portal Service to exchange information with ArcGIS Server and the Map Interface. Responsible for modifications to the non-GIS map reports.
Abe Armijo	Responsible for the software architecture for the Vehicle System.
Tolga Koseoglu	Software coding support to Eric Lahti for the Portal Service, reports and web applications.
Brion Daugherty	Assembly, integration and testing of the Vehicle System, including setting up and managing the software.
Vasu Pillalamarri	Located in Redlands, CA and is the Lead GIS Engineer for the project, reporting to Mike Hollis, the GIS Lead. He is responsible for establishing the GIS architecture and defining connectivity with non-spatial components of the LATATrax solution, and for installing and managing the ArcGIS Server and geodatabase backup processes. Vasu leads geodatabase implementation and processing, and development of the Map Interface common operating picture in ArcGIS Online. He is responsible for ensuring efficient data flows and geoprocessing for ArcGIS for Desktop (ArcMap), ArcGIS for Server, ArcGIS Online and add-ins/extensions such as GeoEvents Processor (GEP) and the Esri Operations Dashboard. He will work closely with Clay Rardin, the GIS Software Developer where custom software solutions are needed.
Clay Rardin	GIS Software Development Lead for the project, responsible for developing custom software code that is needed to tailor and implement Commercial Off the Shelf (COTS) software. He will use the ArcGIS JavaScript application programming interface (API) to configure ArcGIS Online for use as the Map Interface and for data Playback, and provide additional custom code as required. He is responsible for coordinating with other software developers and leads as required to ensure an efficient overall integration of software.
Patrick Wong	Lead for integration of LATATrax with the CHP 911 Dispatch system. He will design the system interfaces to allow the dispatchers to have the required access to the LATATrax information from within the CHP system.
Tommy Chang	Provide installation and field support for the Vehicle System portion of LATATrax and assist with training tow truck drivers.

Figure C-6. Description of Personnel Roles and Responsibilities

2.2 Detailed Staffing Plan for Each Task

Our Staffing Plan leverages the specific qualifications of our Management, Engineering and Support personnel. The qualifications of our two Key Personnel, Mike Hollis and Steve Cobb are discussed in detail in the Qualifications and References section of this proposal.

The Project Staffing Plan is summarized in Figure C-7.

WBS	Task Name	Staffing Plan
1	**Phase 1 System Generation**	
1.1	Project Planning and Management	Mike Hollis, Steve Cobb
1.2	System Analysis	Steve Cobb, Eric Lahti, Mike Hollis, Vasu Pillalamarri, Clay Rardin
1.3	System Development	Steve Cobb, Eric Lahti, Abe Armijo, Brion Daugherty, Mike Hollis, Vasu Pillalamarri, Clay Rardin
1.4	System Integration & Test	Steve Cobb, Eric Lahti, Abe Armijo, Brion Daugherty, Mike Hollis, Vasu Pillalamarri, Clay Rardin, Patrick Wong
2	**Phase II System Delivery**	
2.1	System Installation	Steve Cobb, Eric Lahti, Abe Armijo, Brion Daugherty, Mike Hollis, Vasu Pillalamarri, Clay Rardin, Tommy Chang
2.2	Acceptance Testing	
2.2.1	Testing	Steve Cobb, Eric Lahti, Abe Armijo, Brion Daugherty, Mike Hollis, Vasu Pillalamarri, Clay Rardin, Patrick Wong, Tommy Chang
2.3	Training	Steve Cobb, Brion Daugherty, Mike Hollis
3	**Phase III System Upgrades**	
3.1	Automatic Upgrades	Steve Cobb, Eric Lahti, Abe Armijo, Brion Daugherty, Mike Hollis, Vasu Pillalamarri, Clay Rardin, Patrick Wong
3.2	Task Orders	Mike Hollis, Steve Cobb and others as required
4	**Phase IV Operations and Maintenance**	
4.1	Ongoing Support	Steve Cobb, Brion Daugherty, Mike Hollis, Vasu Pillalamarri, Clay Rardin, Eric Lahti, Tommy Chang

Figure C-7. Project Staffing Plan

3. Approach to Managing Resources and Maintaining Quality Results

3.1 Managing Resources

As explained in "1.1 Integrated Management and Development Process" LATA has a commitment to tried and true best practices approach to managing resources, which includes ITIL, Six Sigma, and Agile development.

LATA's employs robust easy to use and readily available tools that naturally fit into our Management and Development processes providing a consistent approach to managing resources and quality.

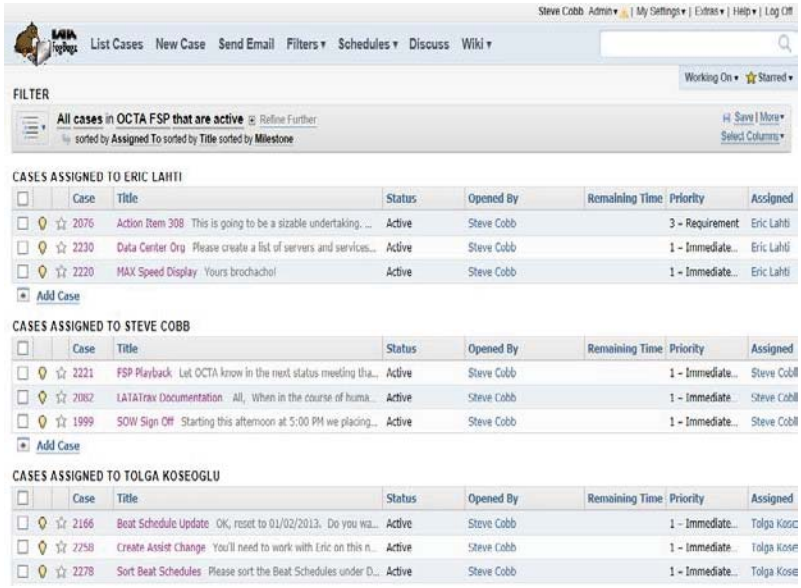


Figure C-8. FogBugz Main Task Screen

FogBugz is a web based project tracking tool selected by LATA as the tool used to support enforcement of our management methods. As seen, in Figure C-8, FogBugz supports our methodology by establishing a project. Under that project, FogBugz has the ability to enter cases (tasks), send emails, produce reports, apply schedules, maintain discussions, and contains a Wiki for knowledge base build-up on each project. It is a simple and easily used tool that keeps all members of a project team well informed as to tasks and progress against those tasks. FogBugz creates a management focus on projects on a "by exception" basis that is enacted, and while time will still permit, to make corrective actions averting quality failures.

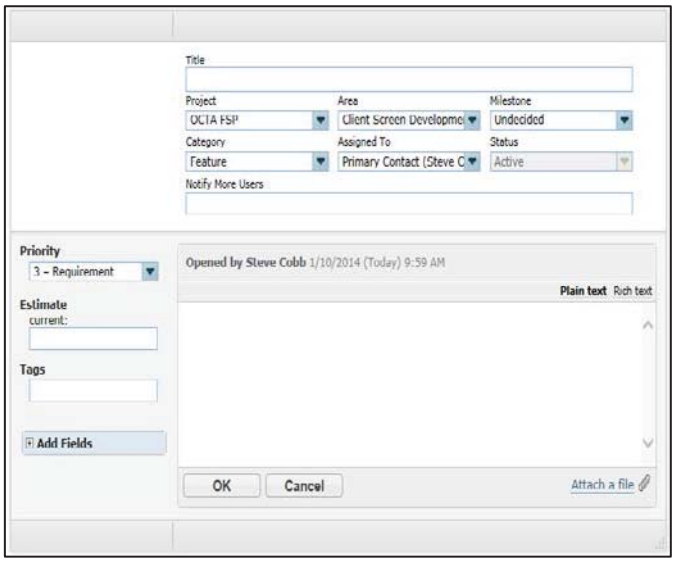


Figure C-9. FogBugz Interface

Once a project plan is produced and tasks are broken down into small manageable units, those tasks are entered into the FogBugz library for assignment and tracking. All individuals who play a role in completion of a task are notified via email that the task has been entered with its associated priority, schedule date, attachments (such as diagrams, specifications, etc.), which milestone it belongs to, what category (Feature, Bug, etc.) the task belongs to, and most importantly what its current status is.

Figure C-10. Root Article Example

Each associated member of the development group (developer, analyst, project manager, etc.) can execute a list of currently assigned tasks, review priorities and resolve conflicts prior to issues "coming to a head." These reports are used in daily "Scrum" meetings (Agile) to explain and bring up to date all other members of the project team as to what they can expect to be done, if there are any road blocks within the critical path that would impede the timely completion of a task and to allows synergistic progress to be made. The Wiki or knowledge area of FogBugz is a critical area to prevent any member of a team from working in

isolation from the “Big Picture” that forms the overreaching project goals. The Wiki is based on what is known as the “root article” that contains an overview in outline form of every major component of the project.

A project team member then can look to a specific article in the project for detailed design descriptions, notes, and areas of concern and select any article (specification/design) document for review and understanding; knowing that all team members are referring to and working toward the same objective. This is the core of quality control: all team members moving in the same united direction to accomplish a goal.

Figure C-11. Wiki Example

Once a sub-article is selected, a team member may open and review any document or information within that sub-article, such as displayed in Figure C-12.

Figure C-12. Document Review

In summary, maintaining quality is a management function, LATA has a long and verifiable record of quality control through strong management supported with tool sets and proven methodologies. LATA has a large and growing customer base that returns to LATA for additional work and many have been with LATA for decades.

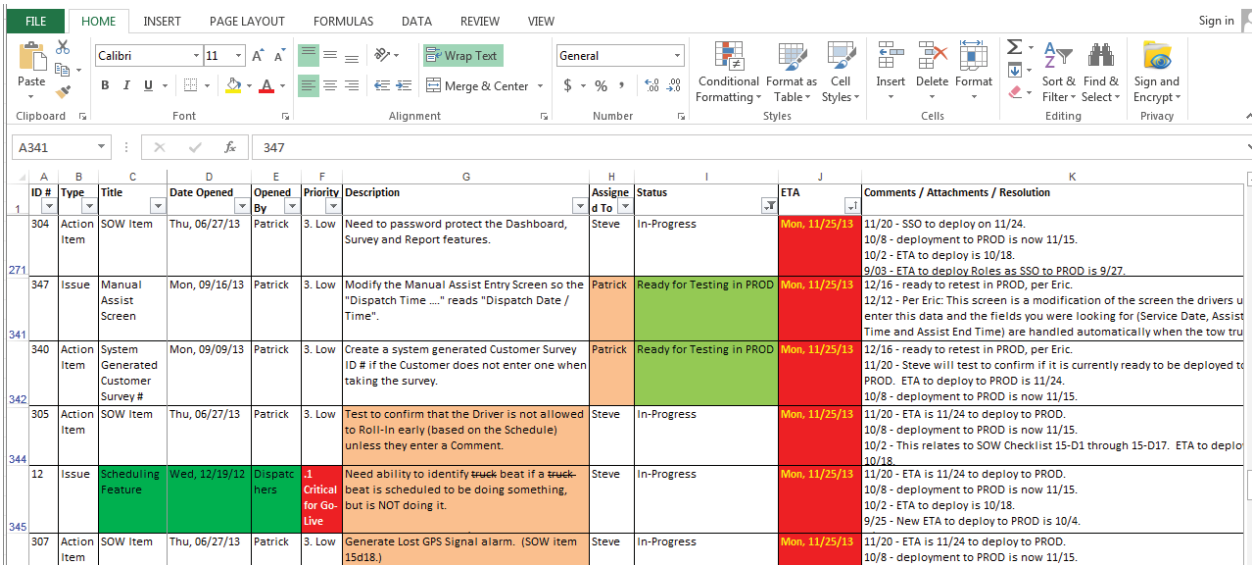
Within the project definition of FogBugz a feature called “Discussion Groups” is employed for the unification of testing, testing results and hypothesis retention. LATA uses this feature to track testing against specifications and encourage group dialogue as to methods, results, failures and successes. Each of these “Discussions” will produce additional sub-tasks that outline and describe fixes or alternatives to errors, omissions, or design flaws.

Using the Deming Cycle as describe in section 1.1 of this document, no element of evolution of a project escapes the team's visibility and the project manager is the controlling quality signoff after all unit, module and regression tests have been executed successfully.

Our customers also participate in FogBugz as the project moves from development into acceptance. Only the customer can authorize a successful advance from the acceptance environment to production. During the customer phase of testing and acceptance, the Project Manager is responsible for documenting customer test results, comments and inputs. The Project Manager provides feedback to the development team via "Scrums" and regularly scheduled meetings with the customer. Once a task has been approved for a move to production the Project Manager will consult with the customer to determine dates and times for the end products to be moved to production.

3.2 Managing Subcontractors

Managing subcontractors requires excellent partnering skills and human relationship development capabilities that are different management techniques than those used internally to an organization. Tools also need to be more generic and common place, yet able to support the vast requirements of inter organizational task management. In light of this understanding LATA uses a complex Microsoft Excel Spreadsheet as seen in Figure C-13.



	ID #	Type	Title	Date Opened	Opened By	Priority	Description	Assigned To	Status	ETA	Comments / Attachments / Resolution
271	304	Action Item	SOW Item	Thu, 06/27/13	Patrick	3. Low	Need to password protect the Dashboard, Survey and Report features.	Steve	In-Progress	Mon, 11/25/13	11/20 - SSO to deploy on 11/24. 10/8 - deployment to PROD is now 11/15. 10/2 - ETA to deploy is 10/18. 9/03 - ETA to deploy Roles as SSO to PROD is 9/27.
341	347	Issue	Manual Assist Screen	Mon, 09/16/13	Patrick	3. Low	Modify the Manual Assist Entry Screen so the "Dispatch Time ...." reads "Dispatch Date / Time".	Patrick	Ready for Testing in PROD	Mon, 11/25/13	12/16 - ready to retest in PROD, per Eric. 12/12 - Per Eric: This screen is a modification of the screen the drivers u enter this data and the fields you were looking for (Service Date, Assist Time and Assist End Time) are handled automatically when the tow tru
342	340	Action Item	System Generated Customer Survey #	Mon, 09/09/13	Patrick	3. Low	Create a system generated Customer Survey ID # if the Customer does not enter one when taking the survey.	Patrick	Ready for Testing in PROD	Mon, 11/25/13	12/16 - ready to retest in PROD, per Eric. 11/20 - Steve will test to confirm if it is currently ready to be deployed to PROD. ETA to deploy to PROD is 11/24. 10/8 - deployment to PROD is now 11/15.
344	305	Action Item	SOW Item	Thu, 06/27/13	Patrick	3. Low	Test to confirm that the Driver is not allowed to Roll-In early (based on the Schedule) unless they enter a Comment.	Steve	In-Progress	Mon, 11/25/13	11/20 - ETA is 11/24 to deploy to PROD. 10/8 - deployment to PROD is now 11/15. 10/2 - This relates to SOW Checklist 15-D1 through 15-D17. ETA to deplo 10/18.
345	12	Issue	Scheduling Feature	Wed, 12/19/12	Dispatchers	.1 Critical for Go-Live	Need ability to identify ~~truck~~ beat if a ~~truck~~ beat is scheduled to be doing something, but is NOT doing it.	Steve	In-Progress	Mon, 11/25/13	11/20 - ETA is 11/24 to deploy to PROD. 10/8 - deployment to PROD is now 11/15. 10/2 - ETA to deploy is 10/18. 9/25 - New ETA to deploy to PROD is 10/4.
	307	Action Item	SOW Item	Thu, 06/27/13	Patrick	3. Low	Generate Lost GPS Signal alarm. (SOW item 15d18.)	Steve	In-Progress	Mon, 11/25/13	11/20 - ETA is 11/24 to deploy to PROD. 10/8 - deployment to PROD is now 11/15.

Figure C-13. Management Spreadsheet

This spreadsheet contains multiple "tabs" that provide similar capabilities as the LATA internal FogBugz project management system, as see in Figure C-14.

Figure C-14. Management System Tabs

Under each tab is expanded information and specification documentation that enable LATA and our sub-contractors to maintain our joint "Big Picture" while we meet the day to day pressures of delivery, keeping in close contact via WebEx and phone conference sessions. Figure C-15 provides an example of one of the many results found by executing the selection of a tab.

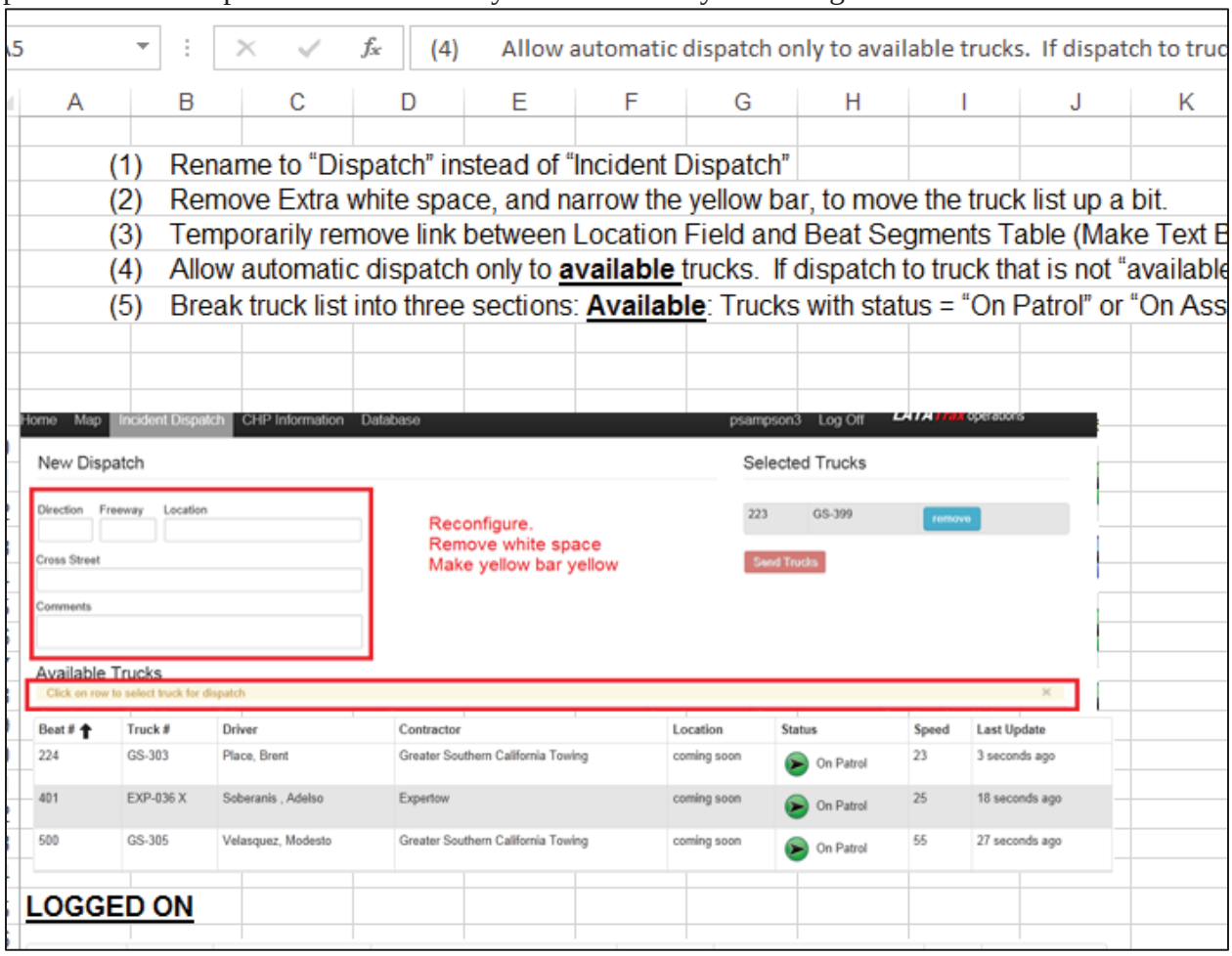

(4) Allow automatic dispatch only to available trucks. If dispatch to truc
(1) Rename to "Dispatch" instead of "Incident Dispatch"
(2) Remove Extra white space, and narrow the yellow bar, to move the truck list up a bit.
(3) Temporarily remove link between Location Field and Beat Segments Table (Make Text E
(4) Allow automatic dispatch only to available trucks. If dispatch to truck that is not "available
(5) Break truck list into three sections: Available: Trucks with status = "On Patrol" or "On Ass
Home Map Incident Dispatch CHP Information Database psampson3 Log Off
New Dispatch
Selected Trucks
Direction Freeway Location
Cross Street
Comments
Reconfigure.
Remove white space
Make yellow bar yellow
Available Trucks
Click on row to select truck for dispatch
Beat # Truck # Driver Contractor Location Status Speed Last Update
224 GS-303 Place, Brent Greater Southern California Towing coming soon On Patrol 23 3 seconds ago
401 EXP-036 X Soberanis , Adelso Expertow coming soon On Patrol 25 18 seconds ago
500 GS-305 Velasquez, Modesto Greater Southern California Towing coming soon On Patrol 55 27 seconds ago
LOGGED ON

Figure C-15. Management System

Additionally, LATA insist upon sub-contractors participating in all schedule project scrum meetings as described by the Agile Development method of project management, insuring all parties remain informed on all progress, issues, roadblocks and resolutions.

4. Explanations of Problem Areas and Potential Obstacles

LATA employs the Six Sigma method of risk assessment and mitigation of Problem Areas and Potential Obstacles. As a result of this assessment we assign a Risk Assessment Code (RAC) to

each major requirement of our proposal. In this way LATA can be proactive in not only our project execution, but in consideration of our response to the MTC SAFE RFP.

Some explanation of how this method works will be useful to understanding our overall assessment of this project and how we develop our mitigation of risk. Our approach calls for the use of proven COTS hardware and we have systems integration experience on similar programs. However, there is increased risk because of the complexity of this project and the requirement for customized software development, now not in use, within LATATrax (i.e., CHP CAD communication with LATATrax FSP system as an example). Experience also shows that unanticipated problems can arise and that the team must be alert and equipped to manage risks and resolve issues prior to impacting the project.

During the execution of all the project phases LATA will assess risks on a continued basis and will use the following process steps:

- Risk Identification (technical, programmatic, environmental)
- Risk Analysis (considers likelihood and consequence)
- Risk Mitigation Planning (for those with high or moderate likelihood and significant consequences)
- Risk Mitigation Plan Implementation (a coordinated effort)
- Risk Tracking (to ensure successful risk mitigation)

Current project specific risk considerations are summarized in the Figure C-16 and use the color schemed table for all tracking:

Risk Assessment Code (RAC)		**Consequence**		
		Low	Medium	High
Likelihood	Low	1 Good	2	3
	Medium	2	3	4
	High	3	4	5 Bad

Figure C-16. Risk Assessment Code Matrix

Risk Identification: The CHP CAD communication API to the LATATrax FSP module will be used as the example to explain how we work this process. Additionally, it is perceived to be an actual risk to the successful delivery of LATATrax to MTC SAFE.

Risk Analysis: First, we assign the RAC. What is the likelihood of failure in successfully creating the communication API? The following are considered for likelihood:

- LATA has a strong staff with high longevity and extraordinary technical skill with an average experience range of 15 years.
- LATA has never seen the communication protocol now employed by CHP CAD.
- LATA has created many data exchange APIs over the last 10 years successfully.
- Are there individuals or organizations available as consultants or sub-contractors who have direct experience or knowledge with this exact requirement?

Upon looking at a few of the likelihood of failure scenarios and associated questionable areas, LATA considers the likelihood rating to be a "medium." Next LATA will consider the impact this likelihood would have on the overall project, in other words the consequence of failure. We look at the conditions and questions such as:

- Will the consequence of failure impact the entire delivery of the project?
- Are there any known solutions in the LATA skill set or program library that can be used as a model?
- What is the time frame plus slack time allocated to produce the API and is that sufficient to mitigate the requirement without outside experience?
- Is the right experience available and contractible?

After reviewing this set of questions LATA considers the consequence rating to be high. Hence, we cross reference the likelihood and consequence to produce the RAC value, which in this case is a 4, the next to highest RAC factor.

Armed with this RAC it is clear that a mitigation plan must be made part of our response to the MTC SAFE RFP proposal.

Risk Mitigation Planning: Identify individuals within LATA with the skill sets to manage a solution to the problem. LATA Human Resources scans the employee knowledge data base looking for skills required or skills that can be transferred to the problem resolution; several are identified. LATA reviews external skill sets that could be contracted or otherwise acquired.

Risk Mitigation Plan Implementation: LATA selects employees for the project with qualifying skills that are capable of producing a quality API (Abe Armijo). Sub-contracts are contacted and interviews held to establish relationships with individuals or companies with the specific skills required (CalPanda). LATA structures a management method to develop the API, test, and implement via our standard management practices to deliver the requirement of a communication link between CHP CAD and LATATrax FSP.

In the Overview and Summary section of this proposal a Description of Particular Challenges summary was presented that relate directly to "Problem Areas and Potential Obstacles."

Additional details are presented in Figure C-17 that relate to successful completion of the Scope of Work.

Challenge	Explanation of Challenges and Methods for Tracking and Resolution
Problem Areas	
AVL field application store and forward *(SOW Requirements Compliance Table paragraph 1.1.6.2)*	RAC = 1, The current system stores all transaction data from the GPS and other sources of application data input in a set rolling system event logs. These logs will be reviewed and analyzed to insure their adaptation will fit into the solution as required.
Advanced search functions for each table *(SOW Requirements Compliance Table paragraph 1.1.7.3.2)*	RAC = 1, The LATATrax database is a fully normalized database using Microsoft SLQ Server 2012. This is a top tier database engine which provided for significantly advance data search functions by a number of tools sets and standard query language (SQL).
File Sharing within the AVL application *(SOW Requirements Compliance Table paragraph 1.1.7.7)*	RAC = 2, The relational database utilization of LATATrax illuminated the requirement for individual files to be created or shared in the fashion described in the RFP and the response to questions, as any set of data is reproducible simply by executing the same search criteria used to obtain the data file.
Access of Desktop features via Web *(SOW Requirements Compliance Table paragraph 1.1.7.8)*	RAC = 1, LATATrax is a web-based fully hosted service based application, accessible via Google Chrome as the standard browser. FusionWhere and Playback apps are Desktop installed modules, the translation of which to a web based hosted service is entirely feasible with minimal effort.
Future VoIP Compatibility *(SOW Requirements Compliance Table paragraph 1.2.1.4)*	RAC = 2, LATA has deployed in our LMDS application VoIP as not only a communication method but also as a text to speech implementation. The conversion of this application to the requirements of the MTC SAFE RFP is entirely feasible with some degree of specification definition.
Scheduling Issues	
Access to test vehicles	RAC = 2, LATA's experience has shown that vehicle access for testing hardware installation and production hardware installation is mitigated by out of service hours and providing for access during those hours. Advance scheduling and access to MTC SAFE partners to facilitate scheduling is generally sufficient mitigation.
Discussions for defining the freeway beats and segments	RAC = 3, The definition of segments, beats, tow contractor yards, drop zone areas, or other significant geo-fenced areas and the rules set is a time consuming effort. However, it must only be done once, other than minor modification to geo-fences based on surface changes or municipality ordinances. It is critical that these discussions be held early in the project with the right people and for sufficient time to create these definitions.

LATATrax development team availability	RAC = 1, Due to the discipline LATA has developed over decades of project management and hundreds of complex diverse requirement sets, we understand the commitment of team members to any project is just that, a commitment. We fit all other needs and demands of the stated team as secondary to contracted project requirements.
Timely Completion Obstacles	
Vehicle hardware issues or failures	RAC = 1, A standardized method of installation is available and a full documentation set has been created that will require minor modifications based upon the few options MTC SAFE must select (i.e. data plan and carrier).
Configuring vehicles	RAC = 1, The consistent use of the standardized configuration method, LATA has created a web site specific to the final configuration of the onboard equipment.
Operator training	RAC = 2, People are the largest variable in any implementation and adaptation of new systems, their care and training is essential to smooth transition and utilization of any system. LATA prides itself on our human interaction skills, our trainers have been contracted to many organizations to deliver everything from nuclear protocols training to the proper use of safety equipment in construction zones.

Figure C-17. Key Issues

D. Qualifications and References

Our LATATrax product team is highly qualified to provide a comprehensive AVL system for MTC SAFE, having just completed a very similar effort for OCTA. The same experienced personnel will work the Bay Area project, backed by the in-depth technical personnel, processes and resources of the larger LATA organization.

Our AVL Team is Rxperienced and in Place

- Our experience with OCTA is both recent and highly relevant to the Bay Area requirements
- Key personnel will continue to perform on the Bay Area LATATrax project
- We have successfully developed transportation applications for mobile devices
- LATA has extensive System Integration experience on high technology programs

1. LATA AVL Product and Team Qualifications

Section II of the RFP, Proposer Minimum Qualifications and Requirements establishes the following minimum qualifications criteria:

1. **Existing AVL System**: Proposer must have an AVL system that connects to the Internet and is managed within its company. This system must have existed for at least a year.
2. **Mobile Apps**: The Proposer's team must have a minimum of one year demonstrable experience developing applications for mobile devices
3. **System Integration**: The Proposer's team must have a minimum of one year demonstrable experience integrating its products with other communications systems to ensure interoperability.

In addition to those minimum requirements, our experience has shown that the following additional qualifications are required to successfully develop, field and support a system that satisfies the requirements of the RFP Scope of Work:

4. **Software Development**: Proven software development tools and approaches that have been used successfully by the development team. Agile approaches and the ability to work with both industry standard software and platforms and open source code provide distinct advantages.
5. **Information Technology (IT**): Experience that extends from mobile systems to Cloud computing and communications for real time, static and geospatial information.
6. **GIS Expertise:** Experience in working with the latest GIS technologies and innovations enables cost effective development of robust location based information solutions with a foundation that supports future enhancements as customer requirements expand.
7. **Field Support:** Experience in maintenance and logistics, including installation and servicing of systems in the field, is essential. Hardware failures or software interruptions must be addressed and resolved quickly to ensure FSP mission success.

1.1 LATA Team Qualifications

The Proposed LATA Team roles and educational background is summarized in Figure D-1 with the names of our two Key Personnel in bold font.

Name	Company	Role	Education
Mike Hollis	LATA	Project Manager, GIS Lead	MS Aeronautical Engineering MS Management BS Naval Science
Steve Cobb	LATA	Product Manager, Chief Technologist	BS Accounting, English, Ethnic Studies AS General Studies
Eric Lahti	LATA	Database Administrator and Software Engineer	MA Speech Communication BS Speech Communication
Abe Armijo	LATA	Vehicle System Lead	BS Computer Science
Brion Daugherty	LATA	Software and Field Test, Training and Documentation	BS Communications
Tolga Koseoglu	LATA	Software Developer	BA Business Administration MIS
Vasu Pillalamarri	LATA	Lead GIS Engineer	MS Computer Information Systems BS Geographic Information Systems BS Chemistry
Clay Rardin	LATA	GIS Software Engineer	BS Physics
Patrick Wong	CalPanda	Software Developer	PhD Computer Science MS Computer and Information Science BS Mathematics and Computer Science
Tommy Chang	Wincal	Field Service	

Figure D-1. LATA Team Summary

Most of our LATA Team Has OCTA LATATrax Experience

Our product and personnel exceed the minimum qualifications requirements as discussed in the following paragraphs. The experience of our team in the areas of expertise specified in the MTC RFP and in LATA's estimation is summarized in Figure D-2 with key personnel names in bold font.

Team Personnel	Areas of Expertise and Experience						
	Existing AVL	Mobile Apps	System Integ.	Softwar e Dev.	IT	GIS	Field Support
Mike Hollis	X		X	X		X	X
Steve Cobb	X	X	X	X	X		X
Eric Lahti	X	X	X	X	X	X	
Abe Armijo	X	X	X	X	X		
Brion Daugherty	X	X	X	X	X	X	X
Tolga Koseoglu	X	X	X	X	X		
Vasu Pillalamarri	X	X	X	X	X	X	X
Clay Rardin	X	X	X	X	X	X	
Patrick Wong		X	X	X	X		
Tommy Chang							X

Figure D-2. LATA Team Experience Summary

Our Personnel Are Highly Experienced in All AVL-related Areas

Further information regarding the qualifications of our team members is provided in the following paragraphs. Qualifications of our two key personnel are provided in paragraph 2, Key Personnel.

1.1.1 Eric Lahti Qualifications

Eric Lahti has extensive experience in commercial and government software development and database development and administration. He also has extensive experience delivering technical training. He most commonly works with database integration and web-based applications, but has developed stand-alone applications as well.

As Database Administrator his recent tasks have included designing and administering the database for the LATA Mobile Data System (LMDS) project. He wrote the system for tracking tow trucks for Orange County Transportation Authority (OCTA); system includes a service for listening for incoming XML packets and processing packets into C# objects, which can then be queried through LINQ and written to a database for logging. He designed and developed the screens the tow-truck drivers use on iPad and Android tablet devices, which integrate into the aforementioned service. The service utilizes the database to grab operating information. Mr. Lahti installed and maintained the servers that comprise the system as well as developing the database backup and copy architecture for all four of the servers. He developed a monitoring system for the LMDS system to run off Blackberry and Android phones.

1.1.2 Abe Armijo Qualifications

Mr. Armijo is an expert in systems engineering and integration, software design and development, database design and management, and training. He has 27 years of experience developing systems and applications in the areas of telecommunications, telemetrics, aerospace, railroad, manufacturing, security, biometrics, and finance.

As Senior Software Engineer, Mr. Armijo designed and developed a vehicle-based GPS/AVL system utilizing many years of experience working with military and commercial GPS receivers

and mobile computing hardware. The embedded system uses the OSGi framework, which provides increased reliability, reduced complexity, and enhances code reuse and maintainability. Position, speed, and status information are sent to the LATA Cloud via cellular modem, and system commands, configuration settings, and code updates are retrieved from the LATA Cloud as needed. The system also serves as a mobile WIFI access point.

1.1.3 Brion Daugherty Qualifications

Mr. Daugherty has over 14 years of experience working with the transportation industry providing product quality control, training, installation, troubleshooting, consulting, and management experience. He has worked on several technically complex projects for LATA including vehicle tracking using GPS, passenger information systems, on-board and platform display systems and custom information systems for the rail industry. Much of his work is in the field where he interacts directly with everyone from enterprise managers to field repair technicians.

Mr. Daugherty designed, built and implemented a complete test system, the training manuals and maintenance procedures for the LATATrax projects. He trained CHP officers and Freeway FSP Drivers in the operation of the LATATrax system. He worked directly with tow truck operators during the roll out of the OCTA system, and worked directly with OCTA project leaders providing support and guidance during the LATATrax rollout at OCTA.

1.1.4 Tolga Koseoglu

Tolga has most of his history in integrating third party software with custom applications and services to improve executive decision-making. He has extensive experience in Silverlight and MVC development and advanced experience in SharePoint administration. His most recent projects are all based around HTML 5 clients, ASP.NET MVC servers, and SQL Server back-end.

1.1.5 Vasu Pillalamarri Qualifications

Vasu served as InfoWhere Inc.'s Principal GIS Administrator and is a former Esri Inc. technical support specialist. He is proficient with ArcGIS for Desktop and ArcGIS Server extensions, GIS database administration, and ArcGIS Online. Vasu has several years of experience in developing GIS solutions for government and commercial applications, including state and local government transportation programs. He is based in Redlands, CA and ensures LATA is able to apply the latest Esri innovations to our products and services. For Bay Area LATATrax he is our lead for geodatabase implementation and processing and for developing solutions for analytics and public information using ArcGIS Online. Vasu developed the Analytics for OCTA LATATrax, which are accessed through ArcGIS Online and Esri Maps for Office. He is highly qualified to handle GIS engineering responsibilities for Bay Area LATATrax due to having both in depth formal education and hands on experience.

1.1.5 Clay Rardin Qualifications

Clay served as the InfoWhere Inc. Senior Software Developer and is our lead software developer. He develops new capabilities for our FusionWhere product, which is used to perform FSP polygon (e.g., beats) operations. Clay is proficient in multiple computer operating systems and languages, and has developed commercial and defense software solutions utilizing both spatial and non-spatial databases. He leads our agile software development projects and is experienced in developing spatial and non-spatially enabled web sites and solutions. He has extensive experience working with databases and developing interactive web solutions. He will work with Vasu Pillalamarri to develop a web-based version of our FusionWhere product to meet MTC SAFE RFP requirements. His formal education in Physics and experience working with ArcGIS platform application program interfaces (APIs) and web application development make him highly qualified to perform GIS software development tasks for LATATrax.

1.1.6 Patrick Wong Qualifications

Patrick was the lead design engineer for the current Bay Area FSP project and built the interfaces between the CHP Emergency 911 CAD and the FSP Server. He has extensive computer science education and experience and is proficient in Microsoft C# .NET Frameworks and Microsoft SQL Server. His VMware ESX visualization software experience makes him highly qualified to perform in the LATA Cloud and LATATrax environment and to assist in system integration.

1.1.7 Tommy Chang Qualifications

Tommy is a principal and lead field engineer for Wincal Technology Corporation. He has extensive experience with Wincal's onboard technologies and support approaches for LATATrax.

1.2 Our Existing LATATrax AVL System Qualifications

The LATATrax system that we developed for Orange County Transportation Authority (OCTA) is our baseline system and has been fielded for over a year. It includes GPS, WiFi and cellular communications equipment installed in tow trucks, tablets for drivers that connect to the WiFi hot spot in the vehicle, tablet interfaces for CHP Officers and a Cloud infrastructure of software and servers that communicate and exchange information with the mobile systems. The system utilizes the Internet, with web applications for all system users. A LATATrax summary showing that it is responsive to the purpose of the RFP and that it is a fully functional AVL system is provided in the Overview and Summary section of this proposal. It is also summarized in the Figure D-3, showing the key elements of the baseline system and the primary personnel who developed those elements.

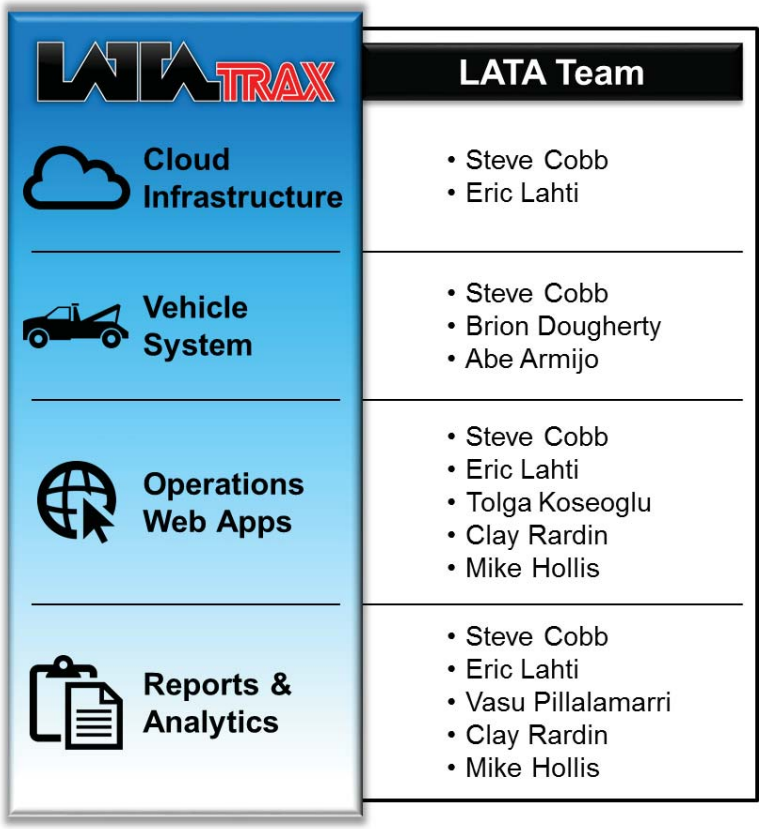


Figure D-3. LATATrax System and Developers
Our personnel are highly experienced in their areas of responsibility

The Cloud Infrastructure consisting of multiple servers and associated communications connections and databases was designed by Mr. Steve Cobb, who is the LATATrax Chief Technologist. Steve has extensive Information Technology (IT) system and database design experience that he has applied to other LATA projects, including a train AVL system for the Chicago Metra commuter rail project.

The Vehicle System which includes vehicle mounted equipment and tablet devices used by the tow truck drivers was designed by a team of LATA project personnel and engineers initially leveraging prior experience with train AVL systems. Abe Armijo performed the programming tasks for the devices and communications interfaces. Steve Cobb worked closely with OCTA personnel to ensure that requirements and user interfaces for the Vehicle System were well understood. Brion Daugherty contributed to the development of the system, focusing on hardware integration, cellular connections, packaging, installation/configuration procedures, documentation and training.

The Operations Web Applications were developed with the participation of multiple team members, led primarily by Eric Lahti. The user interface for the applications consists of multiple web pages that show the common operating picture with moving vehicles, tabular dispatch and status screens and GIS data. Internally, location data is received, processed and used in conjunction with GIS polygons to determine vehicle locations and to provide alerts and alarms based on geofence functionality with beats and segments. The LATATrax web applications are the heart of the AVL solution, providing access to administrative and near real time location information by all authorized system users.

The Reports and Analytics in tabular form were developed by Steve Cobb and Eric Lahti. These reports are primarily the result of SQL Server database queries. The location based analytics using ArcGIS Online were developed by Mike Hollis and Vasu Pillalamarri. Those analytics utilize data from a geodatabase that is sent to ArcGIS Online by ArcGIS desktop or server. Story Maps are a new addition to LATATrax that leverage GIS technologies to creatively inform the public and partner agency personnel. We have recent experience in working with Esri's Story Map templates, which have become available in the last year. Mike Hollis, Clay Rardin and Vasu Pillalamarri have begun work on a Story Map project for the Air Force Research Laboratory in Albuquerque, NM, using the technology to communicate system development, test and evaluation information. The Air Force has project photos, videos and instrumentation data that can be associated geographically with test ranges to convey test sequences and results internally or to the public. This experience is directly applicable to conveying FSP messages to the Bay Area public utilizing historical location data and other customer information.

1.3 Mobile Applications Qualifications

LATA has over three years of experience in developing mobile applications for LATATrax and also in support of commuter rail systems. For LATATrax, the tow truck drivers currently utilize android or iPad tablet devices as a means of communicating with dispatchers, primarily for providing status information. The drivers log on to their tablet and connect with the LATATrax cloud through a web interface. A screen capture for one of the interfaces for this mobile application is provided in Figure D-4.

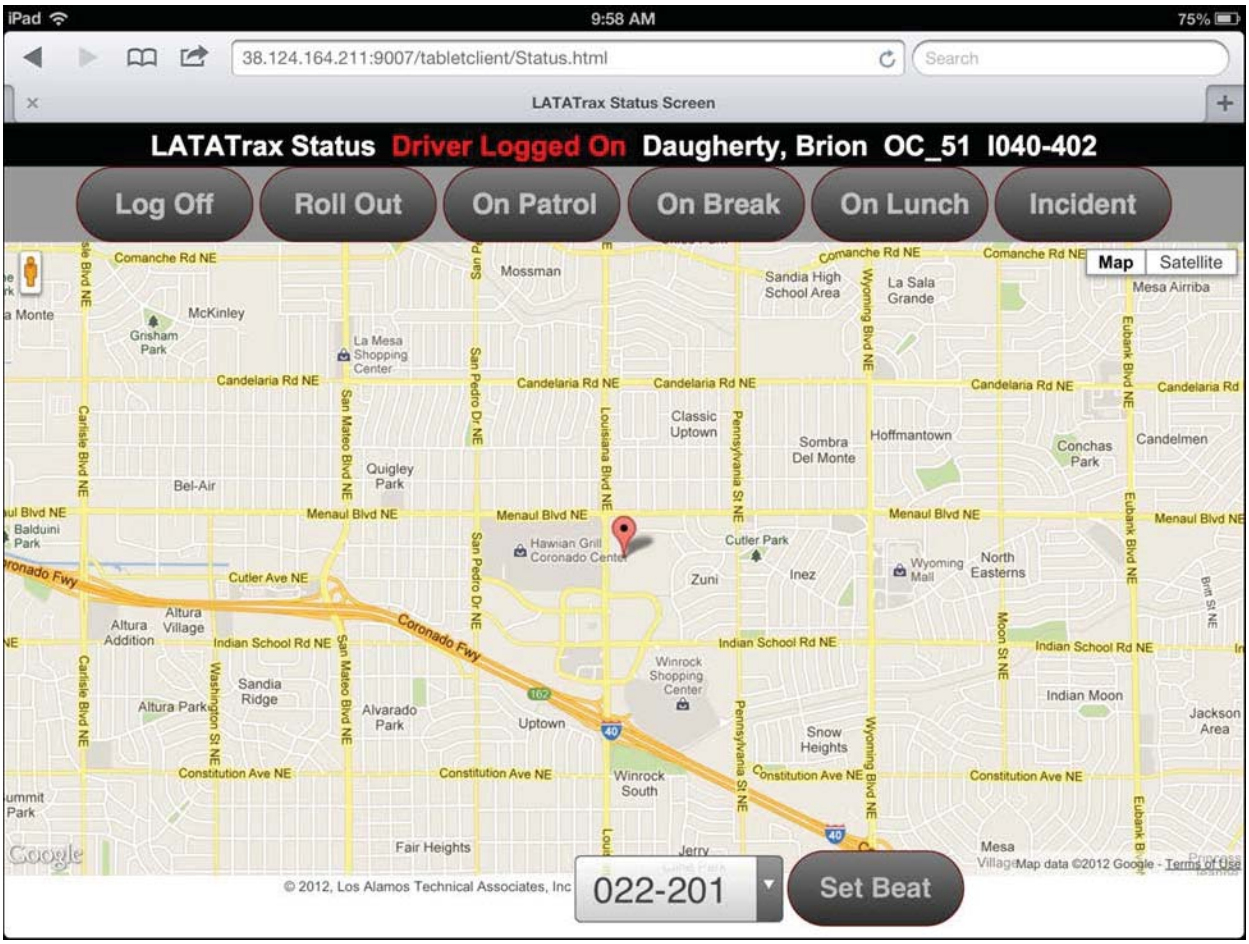


Figure D-4. LATATrax Mobile Application for Tow Truck Drivers
Drivers access this simple to use mobile application via their tablets

Most of the development work for the mobile application was performed by Eric Lahti and Steve Cobb.

A mobile application built for Android and iOS devices was also developed for the Baltimore Metropolitan Transit Authority by Eric Lahti and Tolga Koseoglu. Samples of the interface are provided in Figure D-5.

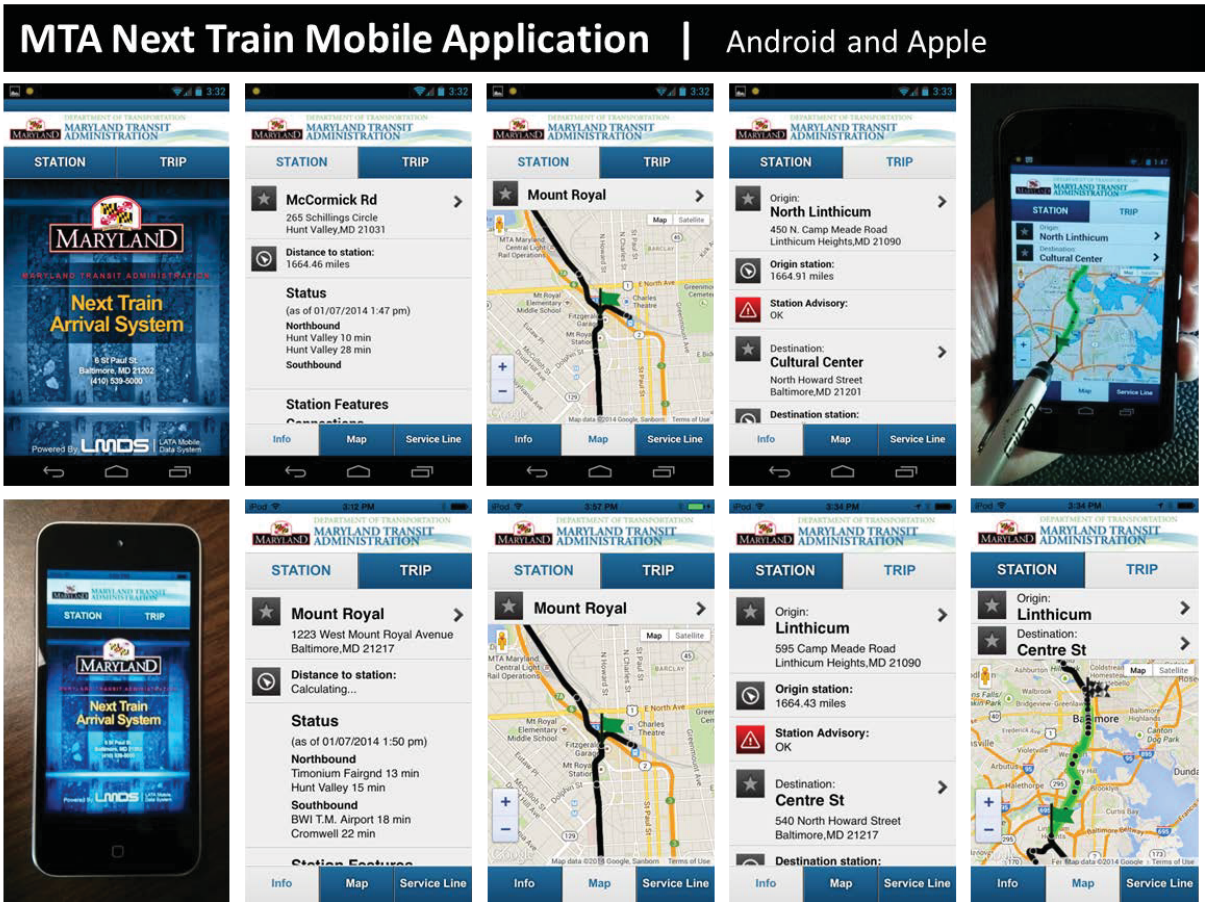


Figure D-5. MTA Mobile Application

Our Team has developed multiple transportation related mobile apps

1.4 System Integration Qualifications

System Integration is the third of the required experience areas. We exceed the minimum requirement of one year demonstrable experience integrating our products with other communications systems to ensure interoperability. Our OCTA LATATrax system has been in operation for over a year, demonstrating highly reliable communications between tow trucks, CHP officers and the LATATrax Cloud. Vehicle location data is transmitted to the Cloud every few seconds, and the drivers connect their tablet devices to the internet via the in-vehicle WiFi hot spot to send status information to dispatchers and to receive instructions. Our system can operate with any cellular carrier and we have demonstrated operations using both AT&T and Verizon networks. We have experience with device drivers and other issues that are unique to individual cellular networks.

Our information system integration experience also includes work performed for Chicago's Metra commuter rail system to connect control center personnel with personnel and/or systems onboard the trains. As an example LATA developed a text to speech application that could be used by control center personnel to broadcast messages on the train using very little bandwidth. This work was performed over two years ago. We also provided mobile and desktop mapping solutions that integrated with the customer's systems.

For the Baltimore MTA Next Train project, our AVL system communicates with their sign control system, passing updated information about train arrivals. We successfully integrated our solution with the existing communications infrastructure.

Mr. Patrick Wong has extensive integration experience in working with CHP CAD. He is our subject matter expert for integrating AVL solutions with CHP CAD.

2. Key Personnel

Contributions of LATA team members were discussed in the preceding LATA Team Qualifications section. This section will address the qualifications of the Key Personnel for the tasks they will be assigned in developing the LATATrax solution for MTC SAFE. Key personnel information is summarized in Figure D-6.

Name	Company	Role	Education
Mike Hollis	LATA	MTC SAFE LATATrax Project Manager, GIS Lead	MS Aeronautical Engineering MS Management BS Naval Science
Steve Cobb	LATA	LATATrax Product Manager, Bay Area LATATrax Project Chief Engineer	BS Accounting, English, Ethnic Studies AS General Studies

Figure D-6. LATA Key Personnel Summary

All of our LATA Key Personnel have OCTA LATATrax Experience

2.1 Mike Hollis Qualifications

Mike has over 30 years of experience in developing, managing and executing large and small technology-centric programs. He has managed numerous information software development programs ranging from developing hyperspectral image analysis software to advanced power systems to web site development. He has served as President of multiple small businesses, including InfoWhere Inc. which was recently acquired by LATA. He has both formal management education and in depth experience derived from managing numerous commercial and government technology programs. He has proven skills for managing small efforts such as $100,000 Small Business Innovation Research projects and large defense acquisition programs valued in hundreds of millions of dollars.

Mike has extensive experience working with sophisticated communications, navigation and mapping systems as a Navy test pilot and as a defense contractor. He applied those skills to Freeway Service Patrol applications as the GIS Lead for OCTA LATATrax. He developed GIS infrastructure elements using ArcGIS Desktop (ArcMap) and ArcGIS Explorer, and the user interfaces for the FusionWhere add-in. Mike maintains a close relationship with Esri GIS leaders in Redlands CA and maintains up to date knowledge on the capabilities of the ArcGIS platform that can be applied to Transportation applications such as LATATrax. He is leading the development of new solutions involving Esri's ArcGIS Online, GeoEvents Processor, Operations Dashboard and Story Maps for LATATrax and other applications. He has a thorough knowledge of the GIS aspects of the baseline LATATrax system and understands how the latest GIS technology developments can be applied to the Bay Area LATATrax system to maximize its performance and reliability.

2.2 Steve Cobb Qualifications

Stephen Cobb is a seasoned senior level, self-motivated, information technology and Geo-Science Architect professional with over 25 years of progressively increased responsibility across several vertical markets. Mr. Cobb is able to deliver in high performance, multi-tasking technical environments and able to work with end users and management in the development of technology requirements, project plans and budgets. Mr. Cobb is experienced in leading and managing highly intelligent technology professionals as cross-functional teams in an Agile with Scrum development environment, delivering multi-year, multi-million dollar critical projects, on time and on budget. Mr. Cobb is a proven positive catalyst for corporate improvement and change; managing multiple technically complex projects simultaneously.

As Product Manager and Information Architect, using Geographic Information System (GIS) Technologies, Mr. Cobb designed and led the development and deployment of the LATATrax product (an ever-present, web-based GIS and command and control system for automatic vehicle location, tracking, and management). LATATrax is fully deployed to Orange County Transportation Authority in Orange County, California, California Highway Patrol's 911 Dispatch Center, and multiple Freeway Service Patrol providers.

2.3 LATA Team Resumes

This section contains the resumes for LATA key personnel, listed in bold. Additional Team member resumes are located in *Appendix 2*.

- **Mike Hollis**
- **Steve Cobb**
- Eric Lahti
- Abe Armijo
- Brion Daugherty
- Tolga Koseoglu
- Vasu Pillalamarri
- Clay Rardin

Michael K. Hollis

Los Alamos Technical Associates, Inc.
mike@infowhere.com

ROLE ON MTC SAFE FSP AVL
Project Manager and GIS Lead

SUMMARY

Mike Hollis has extensive experience in managing sophisticated commercial and defense programs, and in building and leading high performance technology development and operational teams. His varied background includes operations as an Experimental Test Pilot and development of information solutions for business and engineering applications. Serves as the Geographic Information Systems (GIS) lead for the LATATrax system, managing comprehensive GIS data operations and analyses. His extensive program management experience for small and large programs will be applied in his role as the Bay Area LATATrax system.

KEY EXPERTISE

- ✓ Geospatial Applications
- ✓ Aerospace Engineering
- ✓ Program Management
- ✓ Imaging/Sensing Systems
- ✓ Transportation Solutions
- ✓ Information Technologies

PROFESSIONAL EXPERIENCE

InfoWhere Inc. *Albuquerque, NM* *2010 - Present*

- Mr. Hollis is ***President & CEO*** of InfoWhere Inc. that provides desktop, server and Cloud geographic information system (GIS) solutions and services, primarily by configuring Esri's ArcGIS system, and developing custom code as required. Lead projects to develop desktop, server and online transportation solutions.

PCI Geomatics USA Inc. (formerly Geospace Inc.) *Albuquerque, NM* *2006 - 2011*

- ***President & CEO*** of PCI Geomatics USA Inc., a geospatial imagery software and solutions company.

Qynergy Corporation *Albuquerque, NM.* *2003 - 2005*

- As ***President & CEO of Qynergy Corporation,*** an In-Q-Tel portfolio company, Mr. Hollis led development of portable power technology employing radioisotope-semiconductor interactions and nuclear threat detection solutions.

Boeing Laser & Electro-Optical Systems *Albuquerque, NM* *2000 - 2003*

- ***Business Development Manager and Deputy*** **for Advanced Systems**; Mr. Hollis developed new directed energy and electro-optical intelligence, surveillance and reconnaissance system concepts and opportunities for maritime, surface, air and space use. Received an imaging system patent.

SVS R&D Systems Inc. & **SVS Inc.** *Albuquerque, NM* *1996 - 2000*

- **As *President* of SVS R&D Systems Inc. and *Vice President* of SVS Inc.** Mr. Hollis sustained annual growth rate of 30%. SVS was recognized as the highest growth technology company in NM for two years. Boeing acquired SVS in 2000.

Naval Air Systems Command *Arlington, VA* *1994 - 1996*

- ***Director*** of International Programs; Mr. Hollis was responsible for Foreign Military Sales (FMS) of all Naval Aviation weapon systems. Managed FMS programs valued at over $25 Billion.

F/A-18 *Deputy Program Manager*, *Program Executive Officer* (PEO) Tactical Aircraft *1991 - 1994*

- Mr. Hollis led F/A-18 Hornet international sales and program management teams, generating and managing over $4 billion in sales of fighters and logistics services.

Arabian Gulf Battle Force for Operation Desert Storm *1989 - 1991*

- **Battle Force Logistics Coordinator;** responsible for logistics for over 100 coalition ships, including 4 aircraft carriers and their air wings, 26 logistics force ships and 4 super tankers.

OTHER PROFESSIONAL EXPERIENCE

- Aviation Management and Operational Flight Experience
- Chief Test Pilot for Rotary Wing Aircraft Test Directorate at the Naval Air Test Center, extensive test pilot and test project management experience.
- Graduate of Naval Aviation Safety Officer School and services at the squadron level as the Safety Officer and Quality Assurance check flight pilot.
- Naval Air Systems Command C-130 and utility aircraft Deputy Program Manager for new aircraft acquisitions and life cycle support/modernization.
- Air Wing and squadron Maintenance Officer for multiple aircraft types with experience in managing aircraft modifications and configurations.
- Extensive operational flight experience on aircraft carriers, small ships and ashore, including combat operations in Viet Nam as an attack helicopter pilot.

EDUCATION

B.S. U.S. Naval Academy, Annapolis, MD, Naval Science, Aeronautical Engineering and Spanish, graduated with Merit, 1969
M.S. U.S. Naval Postgraduate School, Monterey, CA, Aeronautical Engineering (flight propulsion specialty), selected for Dual Master's Program, 1977
M.S. U.S. Naval Postgraduate School, Monterey, CA, Management (Systems Acquisition Management curriculum), 1978
Engineering Test Pilot, U.S. Naval Test Pilot School, Patuxent River, MD, 1981
Jet and helicopter curriculum; Graduated First in Class
Program Manager Course, Defense Systems Management College, Ft. Belvoir, VA
Five-month course with Masters-level credits

PROFESSIONAL SOCIETIES

Society of Experimental Test Pilots, Directed Energy Professional Society, SPIE, American Society for Photogrammetry and Remote Sensing (ASPRS), Esri Partner Network

Stephen Cobb

Los Alamos Technical Associates, Inc.
Product Manager and Information Architect

ROLE ON MTC SAFE FSP AVL

Chief Engineer and LATATrax Product Manager

SUMMARY

Stephen Cobb is a seasoned senior level, self-motivated, information technology and Geo-Science Architect professional with over 25 years of experience across several vertical markets. Mr. Cobb is able to deliver in high performance, multi-tasking technical environments and able to work with end users and management in the development of technology requirements, project plans and budgets. He also is experienced in leading and managing highly intelligent technology professionals as cross-functional teams in an Agile with Scrum development environment, delivering multi-year, multi-million dollar critical projects, on time and on budget.

KEY EXPERTISE

- ✓ Experienced in developing commercial software using Esri Geographic Information Products such as ArcGIS
- ✓ Expertise in Cloud design, development, and deployment using disparate DB engines
- ✓ Expertise in Enterprise Architecture of IT integration into business strategies
- ✓ Certified in Business modeling using data flows employed within lean six sigma methods
- ✓ Certified in Six Sigma DMADV system design and analysis using the design for Six Sigma strategy
- ✓ PMP - PMBOK Knowledgeable

PROFESSIONAL EXPERIENCE

Los Alamos Technical Associates, Inc. (LATA) *Syracuse, UT Office* *2008 - Present*

- *LATATrax / FSP / OCTA*
  Product Manager and Geo-Science Information Architect, using Geo-Science Information (GIS) Technologies, Mr. Cobb designed and led the development and deployment of the LATATrax product.
- LATATrax was named the LATA, Inc. Project of the Year in 2012. As ***Project Manager, System Architect, and Technical Team*** *Lead*, Mr. Cobb designed, developed, and deployed a tracking and management system for geographically dispersed vehicles.
- The system design employs seamless integration of On-board Computing, GPS, Mobile Wi-Fi hot spot, and Cellular Connectivity providing sub-second two-way communications and data collection in the LATA Cloud. Mr. Cobb designed and implemented the LATA Cloud, a state of the art Tier 4 computing environment (The highest industry rating available for hardened computer facilities) for data collection, storage, web services, application servers, and data warehousing.
- Mr. Cobb designed and constructed a fully redundant Cisco based networking structure with no single points of failure. Additionally, Mr. Cobb designed and implemented a three-level fully redundant web-application-database service delivery architecture, which is a fully fault tolerant computing environment maintaining 100% end-to-end up time. Mr. Cobb remains the ongoing IT Architect, Geo-Science Engineer, Product & Project Manager, and Scrum Master for LATA, Inc.
- *Uranium Disposition Services (UDS), Lexington, KY*

As ***Project Manager***, ***Scrum Master***, ***and Senior Team Member*** of the technical group, LATA was contracted to perform a technology assessment of the service quality provided by the incumbent Information Technology group. Because of the study, the LATA team was awarded the contract for managing all IT services and geo-spatial information tracking technology at UDS Nuclear, Inc.

- Mr. Cobb developed project plans and budgets for submission to management for approval and scheduling, configured detailed project implementation and equipment sequencings for approved projects, and coordinated heavily with the United States Department of Energy's cyber security and networking control offices. Mr. Cobb acted as ***Chief Oracle DBA and Architect*** in absence of a chartered position, managed staff, and provide information professional training.
- *Defense Logistics Agency Information Operations, Hill AFB, UT*
  As ***Scrum Master*** of the technical team, Mr. Cobb managed and fielded worldwide logistics management systems. Focusing on Geo-Spatial Science and artifact management, his duties included DB2 support and performance enhancement of J6O database design at Hill A.F.B. in Ogden Utah. Mr. Cobb saved over $250k annually in operating expenses with a single statistical alteration in SQL optimization. Mr. Cobb continues to manage the LATA Technology team.
- *Chicago Metra, Chicago, IL*
  As a member of the LATA technical team Mr. Cobb engineered and managed the implementation of the network supporting the LATA Mobile Data System (LMDS) package including hardware selection, topology, firewall, secondary site, management and monitoring tools (dashboards). Mr. Cobb provided the final engineering technical specifications for onboard LMT/LST software, LMDS server software, GIS Train Tracking Server, and MS SQL Server database design.

Weber State University *Ogden, UT* *2006 - 2008*
Director of Systems, Operations, and Network Management

- Mr. Cobb was hired as a ***Senior UNIX Administer***, advanced rapidly through the technical ranks, and was promoted to ***Disaster Recovery Manager***, a key role, not only at Weber State University, but to all Utah State Universities. Mr. Cobb provided senior technology support to administrative and instructional computing environments and introduced the Agile development methodology. Mr. Cobb managed all technology staff through a range of tasks supporting the university to include *moving all services and data requirements into leading edge cloud computing*. Mr. Cobb designed improvements resulted in end-to-end uptime for the online learning campus, from less than 80% to over 99.99%.

Flying J Corporation, *Ogden, UT* *1999 - 2006*
Manager of Systems and Databases

- Hired as a ***UNIX System Administrator***, Mr. Cobb advanced rapidly through the technical ranks and moved to a significant management position over the course of his employment with Flying J. He was charged with significantly improving technology across the breadth of one of the largest privately held oil and gas companies in the United States.

EDUCATION

B.S. Accounting, English, and Ethnic Studies, Weber State University, Ogden, Utah 2001
A.S. General Studies, Weber State University, Ogden, Utah,

INDUSTRY CERTIFICATIONS

Esri trained at the "Professional" level
Six Sigma Green Belt
ITIL Cloud Computing, Practitioner, Support and Restore, Fundamentals, Project Management

3. Previous Projects

LATA has performed a number of projects in the past that included services similar to what are being requested in the MTC AVL RFP. Administrative data for the relevant recent previous projects is summarized in Figure D-7.

Project Title	Duration	Budget	Agency	Agency PM
OCTA LATATrax	Ongoing, 5 years	$650K	Orange County Transportation Authority	Mr. Patrick Sampson
Metra GPS System Upgrade	4 years	$4.9M	The commuter rail division of the Regional Transportation Authority of the Chicago area	Mr. Bill Ashbaugh
Nippon Sharyo Highliner 2 Commuter Cars	4 years	$1.7M	Nippon Sharyo Manufacturing, LLC.	Mr. Takashi Ishihara

Figure D-7. Administrative Information for Previous Projects
These projects were selected on the basis of Recency and Relevancy

The relevancy of the three projects to the areas of expertise required for our Bay Area LATATrax solution are summarized Figure D-8.

Previous Projects	Areas of Expertise and Experience						
	Existing AVL	Mobile Apps	System Integ.	Software Dev.	IT	GIS	Field Support
OCTA LATATrax	X	X	X	X	X	X	X
Metra Rail	X	X	X	X	X	X	X
Nippon-Sharayo	X	X	X	X	X		

Figure D-8. Relevancy of Our Previous Projects
We Have Extensive Experience in All Areas Required for AVL System Development & Support

Descriptions of previous projects and the roles of personnel who will be assigned to the Bay Area LATATrax project performed in those projects are discussed in the following paragraphs.

3.1 OCTA LATATrax Project Description and Personnel

As described previously in this proposal, OCTA LATATrax is the baseline LATATrax solution. There is a high degree of commonality between OCTA and MTC SAFE requirements and meeting the additional MTC SAFE requirements is within the capabilities of our current LATATrax team. The team will consist primarily of the same personnel and roles as for OCTA LATATrax. Roles of the LATA team members who will be assigned to the Bay Area LATATrax project are summarized in Figure D-9.

Name	Previous Role	Previous LATATrax Project Task Summary
Mike Hollis	GIS Lead (InfoWhere employee at the time)	Managed development of the OCTA GIS solution and constructed the initial GIS polygon infrastructure for the project. Assisted in the design and testing of FusionWhere upgrades and ArcGIS Online analytics. Developed FusionWhere User Guide and videos for training.
Steve Cobb	Project Manager	Responsible for project cost, schedule, performance, risk management and customer communications. He led the development of the Cloud infrastructure and was involved in the technical execution of all aspects of LATATrax.
Eric Lahti	Database Admin & Software Engineer	Led development of software and database architecture for real time and static applications.
Tolga Koseoglu	Software Engineer	Developed the web map that provides the OCTA common operating picture and provided development support to other LATATrax Cloud and web applications.
Brion Daugherty	Field Engineer	Assisted Steve Cobb and Abe Armijo in making the Vehicle System a success. He integrated hardware and software and performed field installations and tests. He worked with Steve Cobb to develop the mobile system installation guide.
Abe Armijo	Vehicle System Lead	Developed software and configuration data needed to operate the Vehicle System and have reliable interfaces with the cellular network and the tow truck drivers who accessed the system via their tablet devices.
Vasu Pillalamarri	GIS Engineer	Developed the geodatabase configuration and set up ArcGIS Server to work with ArcGIS Online to display historical analytical information. Configured ArcGIS Online to display map reports using time slider to select data intervals and also created Excel analytics monthly reports using Esri Maps for Office
Clay Rardin	GIS Software Engineer	Modified FusionWhere, an ArcGIS Explorer add-in to include enhanced polygon editing capabilities and interfaces to exchange GIS data with servers and databases in the LATATrax Cloud. Built software installers that were delivered to the customer.

Figure D-9. OCTA LATATrax Team Members Who Will Also Work MTC SAFE

3.2 Metra Project Description and Personnel

The Metra project is a complete end-to-end design and development of a new open-systems based Train Location and Passenger Information System to replace the aging GeoFocus System. The embedded program uses train schedules and current position to play announcements, determines station arrival/departure states based on speed and location sends status to and receives commands from a land-based control center via wireless communications. There is a high degree of commonality with vehicle tracking and cellular communications aspects of the Metra project and the Bay Area LATATrax. The team will consist primarily of the same personnel and roles. Roles of the Metra team members for Bay Area LATATrax are summarized in Figure D-10.

Name	Role	Previous Metra Project Task Summary

Steve Cobb	System Engineer	Wrote final technical specifications for the Metra project
Mike Hollis	GIS Support	Coordinated GIS modifications and text to speech solution development
Eric Lahti	Database Admin & Software Engineer	Led development of software and database architecture for real time and static applications.
Brion Daugherty	Field Engineer	Quality Control Engineer for LATA's GPS related projects. He instituted the LATA testing laboratory and is responsible for testing both firmware and software for the LATA Mobile Data System family of products.
Abe Armijo	Vehicle System Lead	Designed and developed an on-board GPS/AVL, passenger announcement application to replace an outdated system.
Vasu Pillalamarri	GIS Engineer	Worked with ArcGIS Server and identified opportunities such as caching for improved system performance.

Figure D-10. Metra Project Members Who Will Also Work MTC SAFE

3.3 Nippon Sharyo Project Description and Personnel

The Nippon Sharyo Project roles held by team members for Bay Area LATATrax are summarized Figure D-11.

Name	Role	Previous LATATrax Project Task Summary
Eric Lahti	Database Admin & Software Engineer	Led development of software and database architecture for real time and static applications.
Brion Daugherty	Field Engineer	Quality Control Engineer for LATA's GPS related projects. He instituted the LATA testing laboratory and is responsible for testing both firmware and software for the LATA Mobile Data System family of products.
Abe Armijo	Vehicle System Lead	Designed and implemented a train-based GPS/AVL application.

Figure D-11. Nippon Sharyo Team Members Who Will Also Work MTC SAFE

4. References

References and associated information for the LATA Team are provided in Figure D-12.

Project	Agency	Year	POC Name	POC email	POC Phone
LATA					
OCTA LATATrax	OCTA	2012-2013	Mr. Patrick Sampson	psampson@octa.net	724-560-5425
Metra GPS Upgrade	Metra	2010-2013	Mr. Bill Ashbaugh	bashbaugh@metrarr.com	312-322-6937

Nippon Sharyo HL2 Commuter Cars	Nippon Sharyo	2011-2014	Mr. Takashi Ishihara	ishihara@nipponsharyo.com	(815) 562-8600, ext. 240
CalPanda					
FSP Project	MTC	2005-2010	Mr.Sze Lei Leong	SLeong@mtc.ca.gov	(510) 817-5803
Fixed Wireless System Project	Adicom Wireless	1996-2001	Mr. Adel Ghanem	aghanem4c@gmail.com	(925) 736-4918
Fixed Wireless System Project	Adicom Wireless	1996-2001	Mr. Christopher Flores	chrisf@sbcglobal.net	(510) 599-7353
Wincal Technology Corporation					
Creative Bus Sales Inc.	OCTA	2010--2013	Mr. Frank Paniaga	fpaniaga@octa.net	909-993-5040
Avail Technologies Inc.	City of Montebello, CA	2008-2011	Mr. Tom Barrio		814-234-3394
Veolia Transportation	LA Transit Authority	2008-2011	Brandon Day		213-272-2113

Figure D-12. LATA Team References

5. Samples of Technical Reports

One technical memo and two samples of technical material developed for OCTA LATATrax are summarized in this section and provided in *Appendix 1*. OCTA LATATrax documents were chosen because of the similarity of OCTA LATATrax and proposed Bay Area LATATrax solutions. Similar documents will be provided for the Bay Area system. The selected technical reports are summarized as follows:

5.1 FusionWhere User Guide

This document was authored by Mike Hollis and delivered to OCTA to document the installation and use of the FusionWhere desktop application for creating, editing and sharing FSP polygon (beat, segment, drop zone, call box and tow truck yards) data that is used by our FSP Operations web application and the Vehicle Map Analytics Pack. The User Guide is supplemented by six short videos (available to proposal evaluators upon request or at Orals) that demonstrate basic FusionWhere capabilities and how to use each of the tools:

- ArcGIS Explorer Introduction
- Beat Operations Demonstration
- Call Box Operations Demonstration
- Drop Zone Operations Demonstration
- Segment Operations Demonstration
- Truck Yard Operations Demonstration

The demonstration videos were also developed by Mike Hollis, as part of InfoWhere Inc., prior to its acquisition by LATA. He was the GIS lead for OCTA LATATrax and continues in that role for LATATrax for MTC SAFE, in addition to being the Project Manager.

5.2 LATATrax Drivers Guide

This document was authored by Steve Cobb and is a guide for installing the in-vehicle equipment for OCTA LATATrax and configuring the communications components to work with the cellular network and the LATATrax Cloud. The installation procedures were developed and validated by LATA personnel (Mr. Steve Cobb and Mr. Brion Daugherty) and have been made available to field support personnel. This technical paper was chosen as an example, as the installation of equipment in MTC SAFE FSP project vehicles will be very similar.

5.3 LATATrax Map Quick Start User Guide

The LATATrax Map Quick Start User Guide was authored by Steve Cobb. The document was delivered to OCTA and the CHP 911 Dispatching Staff. It describes the total capabilities of the mapping system.

6. Summary of All Contracts with MTC, MTC SAFE, BATA, BAIFA or BAHA

A summary of contracts held by the LATA Team companies with MTC, MTC SAFE, BATA, BAIFA or BAHA (“Agencies”) in the past three years is presented in Figure D-13.

Company	RFP Related Agency	Date	Contract Amount	Scope of Work Description
LATA	None	N/A	N/A	N/A
CalPanda	None	N/A	N/A	N/A
Wincal	None	N/A	N/A	N/A

Figure D-13. LATA Team Contracts Summary

are accumulated for each contract or task by assigning each contract or task a unique job code. LATA uses flexible work breakdown structures for each project which can be as detailed as 13 levels. Indirect costs are allocated to each project using methodologies that comply with all the requirements of the Cost Accounting Standards and FAR, Part 31.

LATA employed Grant Thorton as its outside audit agency through 2009 and currently employs Moss Adams, LLP since 2010. LATA's cognizant Government audit agency is the Defense Contract Audit Agency (DCAA). LATA is subject to annual company-wide cost incurred audits by the DCAA, who has finalized an audit of LATA's incurred costs for the period from 2005 through 2006. LATA's accounting system has been reviewed and approved by Defense Contract Audit Agency.

2.2 Timekeeping

For timekeeping, LATA uses the Deltek Electronic Time Collection (ETC) module. ETC allows every employee to input hours worked daily through this web-based application. There are many built-in controls, which allow time to be entered only on charge numbers that have been approved for the individual employee. Any changes are tracked electronically, and the change approval process is also performed electronically, thus eliminating the need for paper documents. This electronic system improves program management efficiency by eliminating the need for reviewing, signing, filing, sorting, and storing paper timesheets. All approved time is imported into the Costpoint system for the processing of payroll and for project costing. This system allows employees to access charge number look-up tables to ensure that they are using the authorized charge number, thereby reducing data entry errors and resulting in more accurate payroll and project labor reporting. This system provides the versatility to establish controls that meet the needs of the specific application. Controls include the setup of various overtime rules, approval and override processes, and restricting the charging of holidays and vacation. These controls improve efficiencies by reducing errors and the need for correcting timesheets.

2.3 Estimating System

LATA's cost estimating process has been developed and utilized on hundreds of commercial and government projects including environmental remediation, professional services, construction and design-build efforts. Our Basis of Estimate and supporting documentation is compliant with all government accounting and acquisition requirements, and has received several favorable remarks by clients and their representatives, including the Defense Contract Audit Agency (DCAA).

Our cost estimating system requires a thorough understanding of the technical requirements associated with a scope of work. Our understanding of the technical requirements is obtained based on a comprehensive review of (1) scope objectives, specifications and required procedures; (2) environmental, health and safety risks and controls; (3) personnel, equipment and materials requirements; (4) regulatory requirements and controls, including permits and reporting; and (5) site characteristics, including applicable contaminates of concern, natural and manmade physical features, and the organizational configuration of responsible decision makers and stakeholders.

Upon understanding of the project technical requirements, a logical work breakdown structure (WBS) and WBS dictionary are created. This WBS is utilized to integrate all LATA earned value management and project control tools, including our Excel-based estimating process which provides a standard format for ensuring that all cost elements (i.e., labor, materials, supplies, equipment, transportation, disposal, subcontractors, other direct costs [ODCs], etc.) are appropriately considered and estimated accordingly. A schedule is developed utilizing the WBS. Each WBS element is estimated individually at the lowest sub-element level, utilizing durations and resource identifications derived from the scheduling phase of the estimating process.

Direct labor rates, overhead, general and administrative and fee rates are all considered and defined as necessary to support the estimate. Unit costs for equipment, materials, craft labor, field supplies, travel and ODCs are developed specifically for each task identified in the WBS. As a result of this process, our estimating program generates cost element estimates for each WBS sub-element, summary element and total project, resulting in a comprehensive Basis of Estimate. The estimate information is utilized to resource load our schedule where the resource estimates are then time phased accordingly and escalated, where applicable, to generate an accurate and reliable cost estimating basis for all project work.

2.4 Travel

LATA travel policies are in accordance with FAR 31.205. Proper prior approval of all employee travel is necessary to ascertain that such travel is reasonable, necessary and, if applicable, within the scope of the project contract. LATA also has in international travel policy and procedure.

2.5 Earned Value Management

LATA possesses mature business systems that have been utilized to support compliance with government regulations and industry best standards for program and project management including earned value management. LATA's earned value management system (EVMS) integrates project and risk management, taking into consideration all environmental, technical, safety, and quality objectives necessary to successfully plan, execute and manage a fully integrated baseline plan. The processes and procedures required as part of our EVMS ensure that all contract deliverables and regulatory requirements are identified, understood, and incorporated into all aspects project planning and execution. Our comprehensive project controls program requires corporate oversight to ensure development and implementation of an effective project and risk management program, accurate progress determination, comprehensive analysis of cost and schedule performance, timely development and implementation of corrective actions as necessary, and on-time, accurate reporting of project status.

LATA's EVMS was developed and implemented to be compliant with the 32 guidelines for EVMS in accordance with ANSI/EIA-748B and provides a systematic approach for integrating and measuring cost, schedule and technical accomplishment associated with project performance. Technical scope, cost and schedule are integrated and linked thru a consistent use of one Work Breakdown Structure (WBS) among all of our EVMS tools utilized for planning and execution of the work, providing the basis for time phased budgets and a comprehensive Performance Measurement Baseline (PMB) plan. Our EVMS is supported by fully integrated, proven systems for scope, cost and schedule management and includes integrated use of

Primavera Project Manager (P6) for scheduling, Primavera Pertmaster for risk management, Microsoft Excel for estimating, Deltek Costpoint for accounting, and Deltek COBRA for earned value management and project reporting. Valid and auditable data is provided by our integrated management systems ensuring accurate performance analysis and identification of risks and opportunities in a timely manner, allowing for the development of risk mitigation and corrective actions as necessary, continually providing a reliable basis for informed decision making throughout project execution.

EVMS will not be used on the MTC SAFE contract, as the administrative and implementation costs are too high for a project of that size.

3. Ethics

LATA employees are required to meet specified standards of conduct in the performance of their duties. Our system of management controls contains a written code of business ethics, an ethics training program, periodic reviews of business practices, a hotline, internal audits and disciplinary action for violations.

4. Rate Structure and Subcontract Mark Ups

4.1 Direct Labor Rates

The proposed labor rates are based on the actual Calendar Year 2014 rates of the individuals proposed to perform the effort. LATA awards merit increases each year in January to all deserving employees, and pay increases take effect January 1 of each following year. The rate proposed will not increase for the 2014 calendar year.

4.2 Indirect Rates

LATA's proposed indirect labor burdens are our Calendar Year 2011 provisional indirect billing rates, which have been approved by the Defense Contract Audit Agency (DCAA. Until LATA's 2014 provisional indirect rates are approved, LATA uses the approved 2011 rates for current proposals. The indirect rates are disclosed in the Appendix B, Cost Price Analysis Form for both LATA Inc. and LATA Test, Engineering, Advisory & Management Services, LLC. (LATA TEAMS), a wholly owned subsidiary of LATA. LATA nor LATA TEAMS have a forward pricing agreement.

Fringe benefits costs are applied to the direct labor cost. Overhead is applied to the sum of direct labor and fringe benefits costs. G&A is applied to all costs, labor as well as other direct and indirect costs.

LATA's fringe benefits pool includes costs which directly relate to employees (labor) such as group insurance, holidays, paid leave, pension, FICA, worker's compensation and state and federal unemployment compensation.

LATA's in-house (LATA facility) overhead consists of costs required to provide space, furnishings, equipment, communications, and certain common administrative costs such as personnel, contracts, and purchasing. This is the overhead rate applicable to this proposal.

LATA's on-site (client facility) overhead applies when the individual is working full time for an extended period in the client's facility with dedicated office space and associated facility support provided at no additional cost to LATA.

LATA's G&A rate expense pool consists principally of LATA's general management, finance, and accounting costs. LATA uses the total cost input method for computing its G&A, thus all costs bear G&A expense.

4.3 Subcontractor Markup

LATA's markup on Subcontractors is inclusive of G&A and Fee. For the purpose of this proposal, LATA is not including any Fee on Subcontractor costs.

4.4 Other Direct Costs (Including Materials & Equipment)

LATA's markup on Other Direct Costs is inclusive of G&A and Fee. For the purpose of this proposal, LATA is not including any Fee on Other Direct Costs.

Travel

LATA's markup on Subcontractors is inclusive of G&A.

Fee

LATA is proposing a 5% Fee on LATA labor only, and 0% Fee on LATA TEAMS, Subcontractor, ODC, and Travel costs.

Validity

The validity of this proposal is 120 days from proposal due date, January 23, 2014.

Project Budget

The Proposer should estimate the costs they will incur for each deliverable and add in any expected fees or profit. The sums of these estimates will indicate the bid amounts for both the development and maintenance of the system. Proposers should thus carefully consider the information entered in the Task Budget spreadsheet and make sure it is consistent with the information provided in the Cost and Price Analysis Form in Appendix B.

The Proposer should attribute the expected costs of developing and testing the test AVL system that are not properly attributable to earlier project deliverables to 'Test AVL System.' The expected cost of updating the Test AVL system after such testing should be attributed to the 'Baseline AVL System' deliverable.

MTC SAFE will make an initial payment of 15% of total project development costs (Phases I, II and III) upon the approval of the contract. During Phases I and II MTC SAFE will make a milestone payment equaling 85% of estimated costs to the Contractor after reviewing and accepting all the deliverables in a project stage. In Phase III MTC SAFE will make a similar milestone payment after the completion of each deliverable (based upon the Contractor's specific estimate for that deliverable), as defined in the table below. Phase IV maintenance and support costs will be reimbursed annually. There will be a fixed task order budget (not included in this form) which MTC SAFE estimates will be $100,000.

Furthermore the Proposer shall indicate in the appropriate fields below: 1) the name, role and billed hourly rates of the key personnel on the project team, information which will be included in the contract; and 2) The Proposer's price, including shipping and handling, to deliver one (1) WiFi/GPS Unit and the cost of the components to mount and secure the WiFi/GPS Unit in an FSP truck. Hardware costs are for informational purposes only - it will be the Contractor's responsibility to ensure a supply of WiFi/GPS Units in good working order.

Proposer Input Required

Initial Payment	$97,642

Proprietary Information

Phase I - System Generation

Stage	*Deliverables*	*Cost*	*Milestone Payment*
Project Planning and Management	Final Project Management Plan	**$10,255**	$8,717
System Analysis	Requirements Analysis Report	**$12,257**	$21,810
	System Implementation Plan	**$13,402**	
System Development	System Design Report	**$3,118**	$5,300
	Acceptance Test Plan	**$3,118**	
System Integration and Test	Test AVL system	**$221,031**	$219,214
	Initial Test Fleet Installation	**$36,867**	
	Total Cost:	$300,048	

Phase II - System Delivery

Stage	*Deliverables*	*Cost*	*Milestone Payment*
System Installation	Baseline AVL system	**$19,341**	$54,979
	Final Test Fleet Installation	**$45,340**	
Acceptance Testing	Final Acceptance and System Verification Report	**$4,627**	$3,933
Training	Training Plan	**$5,123**	$36,622
	Final AVL User Guide	**$16,512**	
	Training Classes	**$21,449**	
Final Vehicle Installation	Final WiFi/GPS Unit Delivery	**$158,798**	$147,310
	Installation Support (2-3 months)	**$14,508**	
	Total Cost:	$285,697	

Proprietary Information

Phase III - System Upgrades *(Concurrent with Phase IV)*

Stage	*Deliverables*	*Cost*	*Milestone Payment*
Automatic Upgrades	All Non-Baseline Features	*$65,203*	see below
	Invoicing Features	**$4,710**	$4,004
	Trouble Ticket Module	**$6,214**	$5,281
	Equipment and Apparel Database	**$6,888**	$5,854
	Reporting Features	**$19,429**	$16,515
	All Remaining Non-Baseline Features	**$27,962**	$23,768

Total Development Cost	$650,948	Phases I, II and III Costs

Phase IV - Support and Maintenance *(Concurrent with Phase III)*

Stage	*Deliverables*	*Cost*	*Milestone Payment*
Ongoing Support	On-Call Technical Support (60 months)	**$115,870**	Annual Payment of $29,473
	Software Compatibility Upgrades (60 months)	**$31,496**	

Total Maintenance Cost	$147,367	Phase IV Costs only

Total Bid	**$798,314**	Phases I - IV Costs

Phase V - Task Orders

Stage	*Deliverables*	*Milestone Payment*	*Cost*
TBD	TBD	TBD	≤ $100,000

Proprietary Information

Direct Labor Costs

Please list key project personnel in descending order according to their billed hourly rate.

Employee Name	Hourly Rate	Employee Title and Role
Mike Hollis	**$212.42**	**Project Manager**
Steve Cobb	**$177.30**	**Product Manager**
	The above hourly rates are for 2014 only. Out year escalation is estimated at 2% yearly.	

Equipment Costs

Cost of WiFi/GPS Unit	**$1,282.72**
Cost of Single Mounting System	**$119.50**

Proprietary Information

APPENDIX B
COST AND PRICE ANALYSIS FORM

COST AND PRICE ANALYSIS - RESEARCH AND DEVELOPMENT CONTRACTS				
This form is to be used in lieu of FAA Form 3515 as provided under FAPR 2-16.260-2, it will be executed and submitted with proposals in response to "Requests for Proposals," for procurement of research and development services. If your cost accounting system does not permit analysis of costs as required, contact the purchasing office for further instructions.				PURCHASE REQUEST NUMBER
NAME AND ADDRESS OF OFFERER **Los Alamos Technical Associates, Inc.** 6501 Americas Parkway NE, Ste. 200 Albuquerque, NM 87110		TITLE OF PROJECT **MTC SAFE AVL**		
DETAIL DESCRIPTION		ESTIMATED HOURS	RATE/HOUR*	TOTAL ESTIMATED COST (Dollars)
1. DIRECT LABOR(Specify)	Significant Customization			
The following categrories are LATA, Inc.:	Hours			
Database Administrator (DBA)	319.5	426	$ 44.30	$ 18,871
Principal Software Engineer	87	116	$ 55.34	$ 6,419
Programmer	53.25	71	$ 24.17	$ 1,716
Test Engineer	303	404	$ 40.60	$ 16,403
Product Manager	432	576	$ 60.96	$ 35,112
Graphic Designer	6	8	$ 33.83	$ 271
Project Manager	101	404	$ 73.17	$ 29,559
The following categrories are LATA TEAMS, LLC				
a wholly-owned subsidiary of LATA Inc. :				
Vasu Pillalamarri, Sr. GIS Eng.		710	$ 42.44	$ 30,132
Clay Rardin, Sr. Software Eng.		380	$ 43.26	$ 16,441
*Direct labor rates calculated over a 5-year period including escalation				
TOTAL DIRECT LABOR				$ 154,923
2. BURDEN (Overhead-specify) Dept. or Cost Center	Burden Rate	X BASE	BURDEN ($)	
LATA Fringe	36.15%	108,350	39,169	
LATA Overhead	89.66%	147,519	132,266	
LATA TEAMS Overhead (Onsite)	51.72%	30,132	15,584	
LATA TEAMS Overhead (Offsite)	84.12%	16,441	13,830	
LATA TEAMS G&A	5.47%	75,987	4,157	
TOTAL BURDEN				205,005
3. DIRECT MATERIAL				
ReliaGate 50-XX				$ 119,400
Cable/Enclosures/Mounting Hard.				$ 13,200
Antenna				$ 8,640
Power Supplies/Tamer				$ 12,000
TOTAL MATERIAL				$ 153,240
4. SPECIAL TESTING (Including field work at Government installations)				
TOTAL SPECIAL TESTING				
5. SPECIAL EQUIPMENT (If direct charge - specify in Exhibit B on reverse				
6. TRAVEL (If direct charge)				
a. TRANSPORTATION			$ 44,629	
b. PER DIEM OR SUBSISTENCE			$ 21,534	
TOTAL TRAVEL				$ 66,163
7. CONSULTANTS (Identify - purpose - rate)				
Software Developer			$ 75.00	
TOTAL CONSULTANTS				$ 13,575
8. SUBCONTRACTORS (Specify in Exhibit A on reverse)				52,490
9. OTHER DIRECT COSTS (Specify in Exhibit B on reverse - explain royalty costs, if any)				$ 75,439
10. TOTAL DIRECT COST AND BURDEN				$ 720,836
11. GENERAL AND ADMINISTRATIVE EXPENSE (Rate % of item nos.)			8.64%	$ 62,280
12. TOTAL ESTIMATED COST				$ 783,116
13. FIXED FEE OR PROFIT (State basis for amount in proposal)		**Only on LATA Loaded Labor**	5.00%	$ 15,198
14. TOTAL ESTIMATED COST AND FIXED FEE OR PROFIT				$ 798,314

Proprietary Information

15. OVERHEAD RATE AND GENERAL AND ADMINISTRATIVE RATE INFORMATION		
A. GOVERNMENT AUDIT PERFORMED *Defense Contract Audit Agency (DCAA)-Final Indirect Cost Rates*	DATE OF AUDIT *9/5/2008*	ACCOUNTING PERIOD COVERED *2005-2006*
B. NAME AND ADDRESS OF GOVERNMENT AGENCY MAKING AUDIT DCAA (Albuquerque Branch Office) 500 Gold Ave. SW, Ste 12100 Albuquerque, NM 87102		C. DO YOUR CONTRACTS PROVIDE NEGOTIATED OVERHEAD RATES? (X) NO ( ) YES *(IF YES, NAME AGENCY NEGOTIATING RATES)*

D. (If no Government rates have been established, furnish the following information)

DEPARTMENT OR COST CENTER	RATE	TOTAL INDIRECT EXPENSE POOL	BASE FOR TOTAL

16. EXHIBIT A - SUBCONTRACT COSTS (If more space needed, use blank sheets, identify item number)

NAME AND ADDRESS OF SUBCONTRACTOR(S)	SUBCONTRACTED WORK	SUBCONTRACT TYPE	SUBCONTRACT AMOUNT
Wincal Technology Corporation	Installation & Maintenance	DBE	$ 46,890
1028 South Greenwood Avenue, Suite 7			
Montebello, CA 90640			
CalPanda, LLC	Software Dev./System Integration	DBE	$ 5,600
1450 Deschutes Pl			
Fremont, CA 94539			
	TOTAL		52,490

17. EXHIBIT B - OTHER DIRECT COSTS (If more space needed, use blank sheets, identify item number)

Shipping	$ 1,641
ESRI Server License	$ 50,635
Hosting	$ 23,163
TOTAL	75,439

CERTIFICATE

The labor rates and the overhead costs are current* and other estimated costs have been determined by generally accepted accounting principles. Bidder represents: (a) that he__has, _X_has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure his contract, and (b) that he__has, _X_has not, paid or agreed to pay to any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract, and agrees to furnish information relating to (a) and (b) above, as requested by the Contracting Officer. It is LATA's policy to use our most recent DCAA approved provisional indirect billing rates for cost proposal purposes; therefore, LATA's proposed indirect rates (Fringe Benefits, Overhead, and G&A) are based on LATA's CY2011 DCAA approved Provisional indirect billing rates. LATA is in the process of developing its provisional indirect billing rates for CY2014. LATA-TEAMS' proposed indirect rates (Overhead and G&A) are based on its indirect rates developed in CY2012; LATA-TEAMS is in the process of developing its provisional indirect billing rates for CY2014

For interpretation of the representation including the term "bona fide employee," see Code of Federal Regulations, Title 44, Part 150.

NO. OF CONTRACTOR EMPLOYEES:	STATE INCORPORATED IN:
[X] 500 AND UNDER [ ] OVER 500 [ ] OVER 750 [ ] OVER 1,000	*New Mexico*
DATE 1/20/2014	SIGNATURE AND TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR Dale Goralczky Dale Goralczky, Contracts Manager

Proprietary Information

ATTACHMENT C-1
COST AND PRICE ANALYSIS FORM

COST AND PRICE ANALYSIS - RESEARCH AND DEVELOPMENT CONTRACTS				
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NAME AND ADDRESS OF OFFERER **Los Alamos Technical Associates, Inc.** 6501 Americas Parkway NE, Ste. 200 Albuquerque, NM 87110		TITLE OF PROJECT **MTC SAFE AVL**		
DETAIL DESCRIPTION		ESTIMATED HOURS	RATE/HOUR*	TOTAL ESTIMATED COST (Dollars)
1. DIRECT LABOR(Specify)	Significant Customization			
The following categrories are LATA, Inc.:	Hours			
Database Administrator (DBA)	319.5	426	$ 44.30	$ 18,871
Principal Software Engineer	87	116	$ 55.34	$ 6,419
Programmer	53.25	71	$ 24.17	$ 1,716
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Clay Rardin, Sr. Software Eng.		380	$ 43.26	$ 16,441
*Direct labor rates calculated over a 5-year period including escalation				
TOTAL DIRECT LABOR				$ 154,923
2. BURDEN (Overhead-specify) Dept. or Cost Center	Burden Rate	X BASE	BURDEN ($)	
LATA Fringe	36.15%	108,350	39,169	
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3. DIRECT MATERIAL				
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Cable/Enclosures/Mounting Hard.				$ 13,200
Antenna				$ 8,640
Power Supplies/Tamer				$ 12,000
TOTAL MATERIAL				$ 153,240
4. SPECIAL TESTING (Including field work at Government installations)				
TOTAL SPECIAL TESTING				
5. SPECIAL EQUIPMENT (If direct charge - specify in Exhibit B on reverse				
6. TRAVEL (If direct charge)				
a. TRANSPORTATION			$ 44,629	
b. PER DIEM OR SUBSISTENCE			$ 21,534	
TOTAL TRAVEL				$ 66,163
7. CONSULTANTS (Identify - purpose - rate)				
Software Developer			$ 75.00	
TOTAL CONSULTANTS				$ 13,575
8. SUBCONTRACTORS (Specify in Exhibit A on reverse)				52,490
9. OTHER DIRECT COSTS (Specify in Exhibit B on reverse - explain royalty costs, if any)				$ 75,439
10. TOTAL DIRECT COST AND BURDEN				$ 720,836
11. GENERAL AND ADMINISTRATIVE EXPENSE (Rate % of item nos.)			8.64%	$ 62,280
12. TOTAL ESTIMATED COST				$ 783,116
13. FIXED FEE OR PROFIT (State basis for amount in proposal)		**Only on LATA Loaded Labor**	5.00%	$ 15,198
14. TOTAL ESTIMATED COST AND FIXED FEE OR PROFIT				$ 798,314

Proprietary Information

15. OVERHEAD RATE AND GENERAL AND ADMINISTRATIVE RATE INFORMATION				
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B. NAME AND ADDRESS OF GOVERNMENT AGENCY MAKING AUDIT DCAA (Albuquerque Branch Office) 500 Gold Ave. SW, Ste 12100 Albuquerque, NM 87102		C. DO YOUR CONTRACTS PROVIDE NEGOTIATED OVERHEAD RATES? (X) NO ( ) YES *(IF YES, NAME AGENCY NEGOTIATING RATES)*		
D. (If no Government rates have been established, furnish the following information)				
DEPARTMENT OR COST CENTER	RATE	TOTAL INDIRECT EXPENSE POOL		BASE FOR TOTAL

16. EXHIBIT A - SUBCONTRACT COSTS (If more space needed, use blank sheets, identify item number)			
NAME AND ADDRESS OF SUBCONTRACTOR(S)	SUBCONTRACTED WORK	SUBCONTRACT	
		TYPE	AMOUNT
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1028 South Greenwood Avenue, Suite 7			
Montebello, CA 90640			
CalPanda, LLC	Software Dev./System Integration	DBE	$ 5,600
1450 Deschutes Pl			
Fremont, CA 94539			
TOTAL			52,490

17. EXHIBIT B - OTHER DIRECT COSTS (If more space needed, use blank sheets, identify item number)	
Shipping	$ 1,641
ESRI Server License	$ 50,635
Hosting	$ 23,163
TOTAL	75,439

CERTIFICATE

The labor rates and the overhead costs are current* and other estimated costs have been determined by generally accepted accounting principles. Bidder represents: (a) that he__has, _X_has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure his contract, and (b) that he__has, _X_has not, paid or agreed to pay to any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract, and agrees to furnish information relating to (a) and (b) above, as requested by the Contracting Officer.

It is LATA's policy to use our most recent DCAA approved provisional indirect billing rates for cost proposal purposes; therefore, LATA's proposed indirect rates (Fringe Benefits, Overhead, and G&A) are based on LATA's CY2011 DCAA approved Provisional indirect billing rates. LATA is in the process of developing its provisional indirect billing rates for CY2014. LATA-TEAMS' proposed indirect rates (Overhead and G&A) are based on its indirect rates developed in CY2012; LATA-TEAMS is in the process of developing its provisional indirect billing rates for CY2014

For interpretation of the representation including the term "bona fide employee," see Code of Federal Regulations, Title 44, Part 150.

NO. OF CONTRACTOR EMPLOYEES:	STATE INCORPORATED IN:
[X] 500 AND UNDER [ ] OVER 500 [ ] OVER 750 [ ] OVER 1,000	*New Mexico*
DATE 1/20/2014	SIGNATURE AND TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR Dale Goralczky, Contracts Manager

Proprietary Information

F. California Levine Act Statement

The California Levine Act Statement documents are included in this section.

APPENDIX C, CALIFORNIA LEVINE ACT STATEMENT

California Government Code § 84308, commonly referred to as the "Levine Act," precludes an officer of a local government agency from participating in the award of a contract if he or she receives any political contributions totaling more than $250 in the 12 months preceding the pendency of the contract award, and for three months following the final decision, from the person or company awarded the contract. This prohibition applies to contributions to the officer, or received by the officer on behalf of any other officer, or on behalf of any candidate for office or on behalf of any committee.

MTC SAFE's commissioners include:

Alicia G. Aguirre	Federal D. Glover	Joe Pirzynski
Tom Azumbrado	Scott Haggerty	Jean Quan
Tom Bates	Anne W. Halsted	Bijan Sartipi
David Campos	Steve Kinsey	James P. Spering
Dave Cortese	Sam Liccardo	Adrienne J. Tissier
Bill Dodd	Mark Luce	Scott Weiner
Dorene M. Giacopini	Jake Mackenzie	Amy Rein Worth

1. Have you or your company, or any agent on behalf of you or your company, made any political contributions of more than $250 to any MTC SAFE commissioner in the 12 months preceding the date of the issuance of this request for qualifications?

   ___ YES _X_ NO
   If yes, please identify the commissioner: _____

2. Do you or your company, or any agency on behalf of you or your company, anticipate or plan to make any political contributions of more than $250 to any MTC SAFE commissioners in the three months following the award of the contract?

   ___ YES _X_ NO
   If yes, please identify the commissioner: _____

Answering yes to either of the two questions above does not preclude MTC SAFE from awarding a contract to your firm. It does, however, preclude the identified commissioner(s) from participating in the contract award process for this contract.

12/18/2013
DATE

Dale Novak
(SIGNATURE OF AUTHORIZED OFFICIAL)

Contracts Manager
(TYPE OR WRITE APPROPRIATE NAME, TITLE)

Los Alamos Technical Associates, Inc.
(TYPE OR WRITE NAME OF COMPANY)

G. Insurance Provisions

The signed acknowledgement that LATA agrees to provide the required certificates of insurance providing verification of the minimum insurance requirements listed in *Appendix D-1,* Insurance Requirements, within ten (10) days of MTC SAFE's notice of award is included in this section.

APPENDIX D-1, INSURANCE REQUIREMENTS

Minimum Insurance Coverages. Contractor shall, at its own expense, obtain and maintain in effect at all times the following types of insurance against claims, damages and losses due to injuries to persons or damage to property or other losses that may arise in connection with the performance of work under this Agreement, placed with insurers with a Best's rating of A-VIII or better.

Yes (√)	**Please certify by checking the box below that required coverages will be provided within ten (10) days of MTC SAFE's notice to firm that it wishes to contract with the firm.**
X	Workers' Compensation Insurance with Statutory limits, and Employer's Liability insurance with a limit of not less than $1,000,000 per employee and $1,000,000 per accident, and any and all other coverage of CONTRACTOR's employees as may be required by applicable law. Such policy shall contain a Waiver of Subrogation in favor of MTC SAFE. Such Workers Compensation & Employers Liability may be waived, if and only for as long as CONTRACTOR is a sole proprietor or a corporation with stock 100% owned by officers with no employees.
X	Commercial General Liability Insurance for Bodily Injury and Property Damage liability, covering the operations of CONTRACTOR and CONTRACTOR's officers, agents, and employees and with limits of liability which shall not be less than $1,000,000 combined single limit per occurrence with a general aggregate liability of not less than $2,000,000, and Personal & Advertising Injury liability with a limit of not less than $1,000,000. Such policy shall contain a Waiver of Subrogation in favor of MTC SAFE. MTC SAFE, Caltrans, and California Highway Patrol (CHP) and their commissioners, directors, officers, representatives, agents and employees are to be named as additional insureds. Such insurance shall be primary and contain a Separation of Insureds Clause as respects any claims, losses or liability arising directly or indirectly from CONTRACTOR's operations.
X	Business Automobile Insurance for all automobiles owned (if any), used or maintained by CONTRACTOR and CONTRACTOR's officers, agents and employees, including but not limited to owned (if any), leased (if any), non-owned and hired automobiles, with limits of liability which shall not be less than $1,000,000 combined single limit per accident.
X	Umbrella Insurance in the amount of $4,000,000 providing excess limits over Employer's Liability, Automobile Liability, and Commercial General Liability Insurance. Such umbrella coverage shall be following form to underlying coverage including all endorsements and additional insured requirements.
X	Errors and Omissions Professional Liability Insurance for errors and omissions and the resulting damages, including, but not limited to, economic loss to MTC and having minimum limits of $5,000,000 per claim, that includes an endorsement for Contingent

	Bodily Injury and Property Damage. Such policy shall contain cyber risk coverages including network and internet security liability coverage, privacy liability coverage and media coverage. Such policy shall contain cyber risk coverages including network and internet security liability coverage, privacy liability coverage and media coverage. The policy shall provide coverage for all work performed by CONTRACTOR and any work performed or conducted by any subcontractor/contractor working for or performing services on behalf of the CONTRACTOR. No contract or agreement between CONTRACTOR and any subcontractor/consultant shall relieve CONTRACTOR of the responsibility for providing this Errors & Omissions or Professional Liability coverage for all work performed by CONTRACTOR and any subcontractor/consultant working on behalf of CONTRACTOR on the project.
X	Property Insurance. Property Insurance covering CONTRACTOR'S own business personal property and equipment to be used in performance of this Agreement, materials or property to be purchased and/or installed on behalf of MTC SAFE (if any), and builders risk for property in the course of construction (if applicable). Coverage shall be written on a "Special Form" policy that includes theft, but excludes earthquake, with limits at least equal to the replacement cost of the property. Such policy shall contain a Waiver of Subrogation in favor of MTC SAFE.

MTC SAFE, Caltrans, and CHP, and their commissioners, directors, officers, representatives, agents and employees are to be named as additional insureds. Such insurance shall be primary and contain a Separation of Insureds Clause as respects any claims, losses or liability arising directly or indirectly from Contractor's operations.

All policies will be issued by insurers acceptable to MTC SAFE, generally with a Best's Rating of A-VIII or better.

Contractor's obligation hereunder may be satisfied in whole or in part by adequately funded self-insurance, upon evidence of financial capacity satisfactory to MTC SAFE.

Contractor shall be responsible for payment of any deductible or retention on Contractor's policies without right of contribution from MTC SAFE. Deductible and retention provisions shall not contain any restrictions as to how or by whom the deductible or retention is paid. Any deductible or retention provision limiting payment to the Named Insured is unacceptable.

In the event that MTC SAFE seeks coverage as an additional insured under any Contractor insurance policy that contains a deductible or self-insured retention, Contractor shall satisfy such deductible or self-insured retention to the extent of loss covered by such policy, for any lawsuit arising from or connected with any alleged act of Contractor, subconsultant, subcontractor, or any of their employees, officers or directors, even if Contractor or subconsultant is not a named defendant in the lawsuit.

If any insurance specified above is written on a "Claims-Made" (rather than an "occurrence") basis, then in addition to the coverage requirements above, Contractor shall:

1. Ensure that the Retroactive Date is shown on the policy, and such date must be before the

date of this Agreement or the beginning of any work under this Agreement;
2. Maintain and provide evidence of similar insurance for at least three (3) years following project completion, including the requirement of adding all additional insureds; and
3. If insurance is cancelled or non-renewed, and not replaced with another claims-made policy form with a Retroactive Date prior to the Agreement effective date, Contractor shall purchase "extended reporting" coverage for a minimum of three (3) years after completion of the work.

All insurance specified above shall remain in force until all work or services to be performed are satisfactorily completed, all of Contractor's personnel, subcontractors, and equipment have been removed from MTC SAFE's property, and the work or services have been formally accepted. Contractor must notify MTC SAFE if any of the above required coverages are non-renewed or cancelled. The failure to procure or maintain required insurance and/or an adequately funded self-insurance program will constitute a material breach of this Agreement.

Prior to commencement of any work hereunder, Contractor shall deliver to MTC SAFE Certificates of Insurance verifying the aforementioned coverages. Such certificates shall make reference to all provisions and endorsements referred to above and shall be signed on behalf of the insurer by an authorized representative thereof.

The foregoing requirements as to the types and limits of insurance coverage to be maintained by Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations otherwise assumed by Contractor pursuant hereto, including, but not limited to, liability assumed pursuant to the Indemnification section of this Agreement.

By signing below you acknowledge and agree to provide the required certificate of insurance providing verification of the minimum insurance requirements listed above within ten (10) days of MTC SAFE's notice to firm that it wishes to contract with the firm.

Representative Name and Title	Los Alamos Technical Associates, Inc. Dale Goralczyk, Contracts Manager
Name of Authorizing Official	Dale Goralczyk, Contracts Manager
Authorized Signature	Dale Goralczyk
Date	January 21, 2014

NOTE: If you were unable to check "Yes" for any of the required minimum insurance coverages listed above, a request for exception to the appropriate insurance requirement(s) must be brought to MTC SAFE's attention no later than closing date/time for receipt of requests for modifications/exceptions. If such modifications/exceptions are not brought to MTC SAFE's attention consistent with the provisions of this RFP, compliance with the insurance requirements will be assumed.

H. Federal Requirements

All federal-required certifications in *Appendix F*, Federal Requirements, related to lobbying, debarment, and Disadvantaged Business Enterprise (DBE) subcontractor information *(Appendices F-1, F-2, F-3, F-4, and F-5)* follow in this section.

APPENDIX F-1, CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

(Third Party Contracts and Subcontracts over $25,000)

Instructions for Certification:

1. By signing and submitting this proposal, the prospective lower tier participant is providing the signed certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, MTC SAFE may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to MTC SAFE if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "lower tier covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact MTC SAFE for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by MTC SAFE.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List issued by U.S. General Service Administration.

8. Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which does a prudent person in the ordinary course of business dealings normally possess.

9. Except for transactions authorized under Paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, MTC SAFE may pursue available remedies including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Lower Tier Covered Transaction

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its "principals" [as defined at 49 CFR Section 29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

01-10-2014
Date

Dale Goralczyk
(signature of authorized official)

Dale Goralczyk, Contracts Manager
(type/print name and title)

APPENDIX F-2, CERTIFICATION OF RESTRICTIONS ON LOBBYING

I, Dale Goralczyk, Contracts Manager (name and title of grantee official) hereby certify on behalf of Los Alamos Technical Associates, Inc. (name of grantee) that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance is placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Executed this 10th day of January, 2014.

By:

Dale Goralczyk
(signature of authorized official)

Contracts Manager
(title of authorized official)

APPENDIX F-3, LOCAL AGENCY CONTRACTOR DBE COMMITMENT

(Inclusive of all DBEs at time of proposal)

NOTE: Please refer to instructions on the reverse side of this form.

Contractor to Complete this Section

1. Local Agency Name: MTC SAFE

2. Project Location: San Francisco Bay Area – Nine Counties

3. Project Description: Freeway Service Patrol (FSP) Automatic Vehicle Locator System

4. Contractor Name: Los Alamos Technical Associates, Inc.

5. Contract DBE Goal %: 3%

DBE Commitment Information

6. Description of Services to be Provided	7. DBE Firm Contact Information	8. DBE Cert. Number	9. DBE %
Install/Operations & Maintenance	Wincal Technology Corp.	36318	5.87%
	Tommy Chang; (323)346-3900		
Software Dev./Integration of System	CALPANDA Engineering, LLC	38961	0.70%
	Patrick Wong; (408)518-0771		

Local Agency to Complete this Section

16. Local Agency Contract Number: _____

17. Federal-aid Project Number: _____

18. Proposed Contract Execution Date: _____

Local Agency certifies that all DBE certifications are valid and the information on this form is complete and accurate:

19. Local Agency Representative Name (Print)

20. Local Agency Representative Signature

21. Date

22. Local Agency Representative Title

23. (Area Code) Tel. No.

10. Total % Claimed: 6.57 %

Dale Goralczyk
11. Preparer's Signature

Dale Goralczyk
12. Preparer's Name (Print)

Contracts Manager
13. Preparer's Title

01-17-14
14. Date

505-880-3440
15. (Area Code) Tel. No.

Distribution: (1) Original – Submit with Award Package
(2) Copy – Local Agency files

INSTRUCTIONS - LOCAL AGENCY CONTRACTOR DBE COMMITMENT

Contractor Section

The Contractor shall:

24. **Local Agency Name** – Enter the name of the local or regional agency that is funding the contract.
25. **Project Location** - Enter the project location as it appears on the project advertisement.
26. **Project Description** - Enter the project description as it appears on the project advertisement (Bridge Rehab, Seismic Rehab, Overlay, Widening, etc)..
27. **Contractor Name** - Enter the contractor's firm name.
28. **Contract DBE Goal %** - Enter the contract DBE goal percentage, as it was reported on the Exhibit 10-I form. See LAPM Chapter 10.
29. **Description of Services to be Provided** - Enter item of work description of services to be provided. Indicate all work to be performed by DBEs including work performed by the prime contractor's own forces, if the prime is a DBE. If 100% of the item is not to be performed or furnished by the DBE, describe the exact portion to be performed or furnished by the DBE. See LAPM Chapter 9 to determine how to count the participation of DBE firms.
30. **DBE Firm Contact Information** - Enter the name and telephone number of all DBE subcontracted contractors. Also, enter the prime contractor's name and telephone number, if the prime is a DBE.
31. **DBE Cert. Number** - Enter the DBEs Certification Identification Number. All DBEs must be certified on the date bids are opened. (DBE subcontracted contractors should notify the prime contractor in writing with the date of the decertification if their status should change during the course of the contract.)
32. **DBE %** - Percent participation of work to be performed or service provided by a DBE. Include the prime contractor if the prime is a DBE. See LAPM Chapter 9 for how to count full/partial participation.
33. **Total % Claimed** – Enter the total participation claimed. If the Total % Claimed is less than item "6. Contract DBE Goal", a Good Faith Effort (GFE) is required.
34. **Preparer's Signature** – The person completing this section of the form for the contractor's firm must sign their name.
35. **Preparer's Name (Print)** – Clearly enter the name of the person signing this section of the form for the contractor.
36. **Preparer's Title** - Enter the position/title of the person signing this section of the form for the contractor.
37. **Date** - Enter the date this section of the form is signed by the preparer.
38. **(Area Code) Tel. No.** - Enter the area code and telephone number of the person signing this section of the form for the contractor.

Local Agency Section:

The Local Agency representative shall:

39. **Local Agency Contract Number** - Enter the Local Agency Contract Number.
40. **Federal-Aid Project Number** - Enter the Federal-Aid Project Number.
41. **Contract Execution Date** - Enter the date the contract was executed and Notice to Proceed issued. See LAPM Chapter 10, page 23.
42. **Local Agency Representative Name (Print)** - Clearly enter the name of the person completing this section.
43. **Local Agency Representative Signature** - The person completing this section of the form for the Local Agency must sign their name to certify that the information in this and the Contractor Section of this form is complete and accurate.
44. **Date** - Enter the date the Local Agency Representative signs the form.
45. **Local Agency Representative Title** - Enter the position/title of the person signing this section of the form.
46. **(Area Code) Tel. No.** - Enter the area code and telephone number of the Local Agency representative signing this section of the form.

APPENDIX F-4, LOCAL AGENCY CONTRACTOR DBE INFORMATION

(Inclusive of all DBEs listed at bid proposal)

NOTE: Please refer to instructions on the reverse side of this form.

Contractor to Complete this Section

1. Local Agency Name: MTC SAFE
2. Project Location: San Francisco Bay Area – Nine Counties
3. Project Description: Freeway Service Patrol (FSP) Automatic Vehicle Locator System
4. Total Contract Award Amount: $ _____
5. Contractor Name: Los Alamos Technical Associates, Inc.
6. Contract DBE Goal %: 3%
7. Total Dollar Amount for all Subcontractors: $ 66,065.35
8. Total Number of all Subcontractors: 3

Award DBE Information

9. Description of Services to be Provided	10. DBE Firm Contact Information	11. DBE Cert. Number	12. DBE Dollar Amount
Install/Operations & Maintenance	Wincal Technology Corp.	36318	$46,890.35
	Tommy Chang; (323)346-3900		
Software Dev./Integration of System	CALPANDA Engineering, LLC	38961	$5,600.00
	Patrick Wong; (408)518-0771		

Local Agency to Complete this Section

20. Local Agency Contract Number: _____
21. Federal-aid Project Number: _____
22. Contract Execution Date: _____

Local Agency certifies that all DBE certifications are valid and the information on this form is complete and accurate:

23. Local Agency Representative Name (Print)

24. Local Agency Representative Signature — 25. Date

26. Local Agency Representative Title — 27. (Area Code) Tel. No.

13. Total Dollars Claimed	$ 52,490.35
14. Total % Claimed	6.57 %

Dale Goralczyk
15. Preparer's Signature

Dale Goralczyk
16. Preparer's Name (Print)

Contracts Manager
17. Preparer's Title

01-17-14 — 18. Date

505-880-3440 — 19. (Area Code) Tel. No.

Caltrans to Complete this Section

Caltrans District Local Assistance Engineer (DLAE) certifies that this form has been reviewed for completeness:

28. DLAE Name (Print) — 29. DLAE Signature — 30. Date

Distribution: (1) Copy – Email a copy to the Caltrans District Local Assistance Engineer (DLAE) within 30 days of contract award. Failure to send a copy to the DLAE within 30 days of contract award may result in delay of payment. (2) Copy – Include in award package sent to Caltrans DLAE (3) Original – Local agency files

INSTRUCTIONS - LOCAL AGENCY CONSULTANT DBE INFORMATION

Contractor Section

The Contractor shall:

31. **Local Agency Name** – Enter the name of the local or regional agency that is funding the contract.
32. **Project Location** - Enter the project location as it appears on the project advertisement.
33. **Project Description** - Enter the project description as it appears on the project advertisement (Bridge Rehab, Seismic Rehab, Overlay, Widening, etc).
34. **Total Contract Award Amount** - Enter the total contract award dollar amount for the prime contractor.
35. **Contractor Name** - Enter the contractor's firm name.
36. **Contract DBE Goal %** - Enter the contract DBE goal percentage, as it was reported on the Exhibit 10-I form. See LAPM Chapter 10.
37. **Total Dollar Amount for all Subcontractors** – Enter the total dollar amount for all subcontracted contractors. SUM = (DBE's + all Non-DBE's). Do **not** include the prime contractor information in this count.
38. **Total number of all subcontractors** – Enter the total number of all subcontracted contractors. SUM = (DBE's + all Non-DBE's). Do **not** include the prime contractor information in this count.
39. **Description of Services to be Provided** - Enter item of work description of services to be provided. Indicate all work to be performed by DBEs including work performed by the prime contractor's own forces, if the prime is a DBE. If 100% of the item is not to be performed or furnished by the DBE, describe the exact portion to be performed or furnished by the DBE. See LAPM Chapter 9 to determine how to count the participation of DBE firms.
40. **DBE Firm Contact Information** - Enter the name and telephone number of all DBE subcontracted contractors. Also, enter the prime contractor's name and telephone number, if the prime is a DBE.
41. **DBE Cert. Number** - Enter the DBE's Certification Identification Number. All DBEs must be certified on the date bids are opened. (DBE subcontracted contractors should notify the prime contractor in writing with the date of the decertification if their status should change during the course of the contract.)
42. **DBE Dollar Amount** - Enter the subcontracted dollar amount of the work to be performed or service to be provided. Include the prime contractor if the prime is a DBE, and include DBEs that are not identified as subcontractors on the Exhibit 10-O1 form. See LAPM Chapter 9 for how to count full/partial participation.
43. **Total Dollars Claimed** – Enter the total dollar amounts for columns 12 and 13.
44. **Total % Claimed** – Enter the total participation claimed for columns 12 and 13. SUM = (item "14. Total Participation Dollars Claimed" divided by item "4. Total Contract Award Amount"). If the Total % Claimed is less than item "6. Contract DBE Goal", a Good Faith Effort (GFE) is required.
45. **Preparer's Signature** – The person completing this section of the form for the contractor's firm must sign their name.
46. **Preparer's Name (Print)** – Clearly enter the name of the person signing this section of the form for the contractor.
47. **Preparer's Title** - Enter the position/title of the person signing this section of the form for the contractor.
48. **Date** - Enter the date this section of the form is signed by the preparer.
49. **(Area Code) Tel. No.** - Enter the area code and telephone number of the person signing this section of the form for the contractor.

Local Agency Section:

The Local Agency representative shall:

50. **Local Agency Contract Number** - Enter the Local Agency Contract Number.
51. **Federal-Aid Project Number** - Enter the Federal-Aid Project Number.
52. **Contract Execution Date** - Enter the date the contract was executed and Notice to Proceed issued. See LAPM Chapter 10, page 23.
53. **Local Agency Representative Name (Print)** - Clearly enter the name of the person completing this section.
54. **Local Agency Representative Signature** - The person completing this section of the form for the Local Agency must sign their name to certify that the information in this and the Contractor Section of this form is complete and accurate.
55. **Date** - Enter the date the Local Agency Representative signs the form.
56. **Local Agency Representative Title** - Enter the position/title of the person signing this section of the form.
57. **(Area Code) Tel. No.** - Enter the area code and telephone number of the Local Agency representative signing this section of the form.

Caltrans Section:

Caltrans District Local Assistance Engineer (DLAE) shall:

58. **DLAE Name (Print)** – Clearly enter the name of the DLAE.
59. **DLAE Signature** – DLAE must sign this section of the form to certify that it has been reviewed for completeness.
60. **Date** - Enter the date that the DLAE signs this section the form.

APPENDIX F-5, DBE INFORMATION – GOOD FAITH EFFORTS

Federal-aid Project No. _____ Bid Opening Date _____

The Metropolitan Transportation Commission Service Authority for Freeways and Expressways (MTC SAFE) established a Disadvantaged Business Enterprise (DBE) goal of 3% for this project. The information provided herein shows that a good faith effort was made.

Lowest, second lowest and third lowest bidders shall submit the following information to document adequate good faith efforts. Bidders should submit the following information even if the "Local Agency Bidder DBE Commitment" form indicates that the bidder has met the DBE goal. This will protect the bidder's eligibility for award of the contract if the administering agency determines that the bidder failed to meet the goal for various reasons, e.g., a DBE firm was not certified at bid opening, or the bidder made a mathematical error.

Submittal of only the "Local Agency Bidder DBE Commitment" form may not provide sufficient documentation to demonstrate that adequate good faith efforts were made.

The following items are listed in the Section entitled "Submission of DBE Commitment" of the Special Provisions:

A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (please attach copies of advertisements or proofs of publication):

Publications: Date of Advertisement:

_____

_____

_____

_____

_____

_____

B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested (please attach copies of solicitations, telephone records, fax confirmations, etc.):

Names of DBEs Solicited: Date of Initial Solicitation: Follow Up Methods and Dates:

_____

_____

_____

C. The items of work which the bidder made available to DBE firms including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to facilitate DBE participation was made available to DBE firms.

Item of Work:	Bidder Normally Performs Item (Y/N):	Breakdown of Items:	Amount ($):	Percentage of Contract:

D. The names, addresses and phone numbers of rejected DBE firms, the reasons for the bidder's rejection of the DBEs, the firms selected for that work (please attach copies of quotes from the firms involved), and the price difference for each DBE if the selected firm is not a DBE:

Names, addresses and phone numbers of rejected DBEs and the reasons for the bidder's rejection of the DBEs:

Names, addresses and phone numbers of firms selected for the work above:

E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs:

F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate:

G. The names of agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using DBE firms (please attach copies of requests to agencies and any responses received, i.e., lists, Internet page download, etc.):

Name of Agency/Organization:	Method/Date of Contact:	Results:

H. Any additional data to support a demonstration of good faith efforts (use additional sheets if necessary):

NOTE: USE ADDITIONAL SHEETS OF PAPER IF NECESSARY.

ATTACHMENT H-1

Exhibit 10-O1: Local Agency Contractor DBE Commitment (Inclusive of all DBEs at time of proposal)

NOTE: Please refer to instructions on the reverse side of this form.

Contractor to Complete this Section

1. Local Agency Name: MTC SAFE
2. Project Location: San Francisco Bay Area – Nine Counties
3. Project Description: Freeway Service Patrol (FSP) Automatic Vehicle Locator System
4. Contractor Name: Los Alamos Technical Associates, Inc.
5. Contract DBE Goal %: 3%

DBE Commitment Information

6. Description of Services to be Provided	7. DBE Firm Contact Information	8. DBE Cert. Number	9. DBE %
Install/Operations & Maintenance	Wincal Technology Corp.	36318	5.87%
	Tommy Chang; (323)346-3900		
Software Dev./Integration of System	CALPANDA Engineering, LLC	38961	0.70%
	Patrick Wong; (408)518-0771		

Local Agency to Complete this Section

16. Local Agency Contract Number: _____

17. Federal-aid Project Number: _____

18. Proposed Contract Execution Date: _____

Local Agency certifies that all DBE certifications are valid and the information on this form is complete and accurate:

19. Local Agency Representative Name (Print)

20. Local Agency Representative Signature

21. Date

22. Local Agency Representative Title

23. (Area Code) Tel. No.

10. Total % Claimed: 6.57 %

11. Preparer's Signature: Dale Goralczyk

12. Preparer's Name (Print): Dale Goralczyk

13. Preparer's Title: Contracts Manager

14. Date: 01-17-14

15. (Area Code) Tel. No.: 505-880-3440

Distribution: (1) Original – Submit with Award Package
(2) Copy – Local Agency files

ATTACHMENT H-2

Exhibit 10-O2: Local Agency Contractor DBE Information
(Inclusive of all DBEs listed at bid proposal)

NOTE: Please refer to instructions on the reverse side of this form.

Contractor to Complete this Section

1. Local Agency Name: MTC SAFE
2. Project Location: San Francisco Bay Area – Nine Counties
3. Project Description: Freeway Service Patrol (FSP) Automatic Vehicle Locator System
4. Total Contract Award Amount: $
5. Contractor Name: Los Alamos Technical Associates, Inc.
6. Contract DBE Goal %: 3%
7. Total Dollar Amount for all Subcontractors: $ 66,065.35
8. Total Number of all Subcontractors: 3

Award DBE Information

9. Description of Services to be Provided	10. DBE Firm Contact Information	11. DBE Cert. Number	12. DBE Dollar Amount
Install/Operations & Maintenance	Wincal Technology Corp.	36318	$46,890.35
	Tommy Chang; (323)346-3900		
Software Dev./Integration of System	CALPANDA Engineering, LLC	38961	$5,600.00
	Patrick Wong; (408)518-0771		

Local Agency to Complete this Section

20. Local Agency Contract Number: _____

21. Federal-aid Project Number: _____

22. Contract Execution Date: _____

Local Agency certifies that all DBE certifications are valid and the information on this form is complete and accurate:

23. Local Agency Representative Name (Print)

24. Local Agency Representative Signature — 25. Date

26. Local Agency Representative Title — 27. (Area Code) Tel. No.

13. Total Dollars Claimed	$ 52,490.35
14. Total % Claimed	6.57 %

15. Preparer's Signature: Dale Goralczyk

16. Preparer's Name (Print): Dale Goralczyk

17. Preparer's Title: Contracts Manager

18. Date: 01-17-14

19. (Area Code) Tel. No.: 505-880-3440

Caltrans to Complete this Section

Caltrans District Local Assistance Engineer (DLAE) certifies that this form has been reviewed for completeness:

28. DLAE Name (Print) — 29. DLAE Signature — 30. Date

Distribution: (1) Copy – Email a copy to the Caltrans District Local Assistance Engineer (DLAE) within 30 days of contract award. Failure to send a copy to the DLAE within 30 days of contract award may result in delay of payment.
(2) Copy – Include in award package sent to Caltrans DLAE (3) Original – Local agency files

APPENDIX F-1, CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

(Third Party Contracts and Subcontracts over $25,000)

Instructions for Certification:

1. By signing and submitting this proposal, the prospective lower tier participant is providing the signed certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, MTC SAFE may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to MTC SAFE if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "lower tier covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact MTC SAFE for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by MTC SAFE.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List issued by U.S. General Service Administration.

8. Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which does a prudent person in the ordinary course of business dealings normally possess.

9. Except for transactions authorized under Paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, MTC SAFE may pursue available remedies including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Lower Tier Covered Transaction

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its "principals" [as defined at 49 CFR Section 29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

January 8, 2014

Date

Patrick Wong

(signature of authorized official)

Patrick Wong

CALPANDA Engineering LLC, Owner/Chief Engineer

(type/print name and title)

APPENDIX F-2, CERTIFICATION OF RESTRICTIONS ON LOBBYING

I, Patrick Wong, Owner/Chief Engineer hereby certify on behalf of Patrick Wong that:
(name and title of grantee official) (name of grantee)

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance is placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Executed this 8th day of January, 2014, ~~2013~~.

By:

Patrick Wong

(signature of authorized official)

Patrick Wong

CALPANDA Engineering LLC, Owner/Chief Engineer

(title of authorized official)

APPENDIX F-1, CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

(Third Party Contracts and Subcontracts over $25,000)

Instructions for Certification:

1. By signing and submitting this proposal, the prospective lower tier participant is providing the signed certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, MTC SAFE may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to MTC SAFE if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "lower tier covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact MTC SAFE for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by MTC SAFE.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List issued by U.S. General Service Administration.

8. Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which does a prudent person in the ordinary course of business dealings normally possess.

9. Except for transactions authorized under Paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, MTC SAFE may pursue available remedies including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Lower Tier Covered Transaction

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its "principals" [as defined at 49 CFR Section 29.105(p)] is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

1-8-14
Date

Tommy X C Chang
(signature of authorized official)

TOMMY CHANG, OWNER
(type/print name and title)

APPENDIX F-2, CERTIFICATION OF RESTRICTIONS ON LOBBYING

I, TOMMY CHANG, OWNER (name and title of grantee official) hereby certify on behalf of WINCAL TECHNOLOGY (name of grantee) that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance is placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Executed this EIGHTH day of JANUARY ~~, 2013.~~ 2014

By:

Tommy H C Chang
(signature of authorized official)

OWNER
(title of authorized official)

I. Iran Contracting Act

Signed Iran Contracting Act Documents (*Appendix G* from the RFP) are included in this section.

APPENDIX G, IRAN CONTRACTING ACT

(Public Contract Code sections 2202-2208)

Prior to bidding on, submitting a proposal or executing a contract or renewal for a MTC SAFE contract for goods or services of $1,000,000 or more, a Proposer must either: a) certify it is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b) and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS; or b) demonstrate it has been exempted from the certification requirement for that solicitation or contract pursuant to Public Contract Code section 2203(c) or (d).

To comply with this requirement, please insert your Proposer or financial institution name and Federal ID Number (if available) and complete one of the options below. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of $250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (Public Contract Code section 2205.)

OPTION #1 - CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below is not on the current list of persons engaged in investment activities in Iran created by DGS and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

Proposer Name/Financial Institution (Printed) Los Alamos Technical Associates	*Federal ID Number (or n/a)* 850241011
By (Authorized Signature) Dale Goralczyk	
Printed Name and Title of Person Signing Dale Goralczyk, Contracts Manager	
Date Executed 12-18-2013	*Executed in* Albuquerque, NM

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a Proposer/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services.

If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

Proposer Name/Financial Institution (Printed)	*Federal ID Number (or N/A)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	*Date Executed*

APPENDIX G, IRAN CONTRACTING ACT

(Public Contract Code sections 2202-2208)

Prior to bidding on, submitting a proposal or executing a contract or renewal for a MTC SAFE contract for goods or services of $1,000,000 or more, a Proposer must either: a) certify it is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b) and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS; or b) demonstrate it has been exempted from the certification requirement for that solicitation or contract pursuant to Public Contract Code section 2203(c) or (d).

To comply with this requirement, please insert your Proposer or financial institution name and Federal ID Number (if available) and complete one of the options below. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of $250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (Public Contract Code section 2205.)

OPTION #1 - CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below is not on the current list of persons engaged in investment activities in Iran created by DGS and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

Proposer Name/Financial Institution (Printed) Patrick Wong	*Federal ID Number (or n/a)* n/a
By (Authorized Signature) Patrick Wong	
Printed Name and Title of Person Signing Patrick Wong, CALPANDA Engineering LLC, Owner/Chief Engineer	
Date Executed Jan. 8, 2014	*Executed in*

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a Proposer/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services.

If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

Proposer Name/Financial Institution (Printed)	*Federal ID Number (or N/A)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	*Date Executed*

APPENDIX G, IRAN CONTRACTING ACT

(Public Contract Code sections 2202-2208)

Prior to bidding on, submitting a proposal or executing a contract or renewal for a MTC SAFE contract for goods or services of $1,000,000 or more, a Proposer must either: a) certify it is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b) and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS; or b) demonstrate it has been exempted from the certification requirement for that solicitation or contract pursuant to Public Contract Code section 2203(c) or (d).

To comply with this requirement, please insert your Proposer or financial institution name and Federal ID Number (if available) and complete one of the options below. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of $250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (Public Contract Code section 2205.)

OPTION #1 - CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below is not on the current list of persons engaged in investment activities in Iran created by DGS and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

Proposer Name/Financial Institution (Printed)	*Federal ID Number (or n/a)*
WINCAL TECHNOLOGY CORPORATION	33-0398511
By (Authorized Signature) Tommy W C Chang	
Printed Name and Title of Person Signing TOMMY CHANG, OWNER	
Date Executed 1-8-14	*Executed in* CALIFORNIA

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a Proposer/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services.

If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

Proposer Name/Financial Institution (Printed)	*Federal ID Number (or N/A)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	*Date Executed*

Appendix 1 – Additional LATA Team Resumes

- Eric Lahti
- Abe Armijo
- Brion Daugherty
- Tolga Koseoglu
- Vasu Pillalamarri
- Clay Rardin

Eric Lahti

Los Alamos Technical Associates, Inc.
Database Administrator

ROLE ON MTC SAFE FSP AVL

Database Administration and Development Lead

SUMMARY

Eric Lahti has extensive experience in commercial and government software development and database development and administration. He also has extensive experience delivering technical training. He most commonly works with database integration and web-based applications, but has developed stand-alone applications as well.

KEY EXPERTISE

- ✓ Software Developer, proficient in developing for the Windows environment using C#, VisualBasic.NET and developing for WCF and MVC
- ✓ Database Administration/Development, proficient in MS SQL Server with experience in MySQL
- ✓ Proven experience developing commercial software using Agile software methodologies
- ✓ Experience in developing web-based applications with ASP.NET, HTML, JavaScript, jQuery, JSON, XML and CSS

PROFESSIONAL EXPERIENCE

Los Alamos Technical Associates (LATA) *Albuquerque, NM* *2010 – Present*

Database Administrator for designing and administering the database for the LATA Mobile Data System (LMDS) project. Mr. Lahti created a WCF service to connect the various components of the LMDS project together and wrote a Silverlight-based application for administration of the WCF service and the LMT components of the system.

- *Orange County Transportation Authority (OCTA)*
  Mr. Lahti wrote the system for tracking tow trucks for Orange County Transportation Authority (OCTA); system includes a service for listening for incoming XML packets and processing packets into C# objects, which can then be queried through LINQ and written to a database for logging. He designed and developed the screens the tow-truck drivers use on iPad and Android tablet devices, which integrate into the aforementioned service.

- Developed a monitoring system for the LMDS system to run off Blackberry and Android phones.

- Scripted an IIS monitoring service to notify selected users when a site or application pool stops and then attempt to restart that site or pool

- Mr. Lahti authored a mobile version of the LMDS messaging system using MVC3, HTML5 and jQuery to allow messaging from a wider variety of platforms.

- *Maryland Transit Authority (MTA)*
  Constructed the NextTrain service and database for Baltimore MTA to display an approximate arrival time of the next two trains at any given station along any of the routes and integrated GTFS schedules into the system.

- He designed a service to integrate data from Nomad portable computers sending basic GPS information into an existing GeoFocus installation for the Capitol Corridor Joint Powers Authority's commuter heavy rail system in California.

- Mr. Lahti is currently working on integrating GTFS data into LMDS for schedule updates and GTFS-Real-time feeds.

MSX, CC&G Company, Kirtland Air Force Base *Albuquerque, NM* *2009 - 2010*

- Mr. Lahti redesigned the TTRAPS application from the ground up, to include developing a new database model, importing old data into the new database and rewriting he front end as a web-based asp.net application.

New Mexico Department of Education *Albuquerque, NM* *2009 - 2009*

- As a ***Software Developer,*** Mr. Lahti developed a database to house information about students participating in the NM GearUP Program and a web-based front-end to the application that allowed administrators to enroll students in the program and track their progress through the program including what classes were taken, what grades they got, what activities they participated in and graduation dates. The front-end was written in C# and implemented as an ASP.NET application with a Microsoft SQL Server 2008 back-end. Crystal Reports, driven the through the front-end, allowed easy reporting on the data.

New Mexico Department of Health, Cancer Council *Albuquerque, NM* *2009 - 2009*

- ***Software Developer***. Developed a database to house custom surveys and answers to delivered surveys, with an ASP.NET based front-end written in C#. The application essentially allowed users to design custom surveys, store them in the database, call them up through the web-based front end, enter answers to the survey questions, store those answers in the database, and then run reports on the data from the front-end. Used ASP.NET C# for the web application, SQL Server 2008 for the database and Crystal Reports for the report engine.

EDUCATION

Master of Arts: Speech Communication, Eastern New Mexico University, 1998
Bachelor of Science: Speech Communication, Eastern New Mexico University, 1996

TECHNICAL CERTIFICATIONS

Microsoft Certified Systems Engineer (MCSE) in Windows NT 4, Windows 2000, Windows 2003
Microsoft Certified Database Administrator (MCDBA) SQL Server 7, SQL Server 2000
Microsoft Certified Solution Developer (MCSD) Visual Basic 6 and .NET
Former Microsoft Certified Trainer
Citrix Certified Enterprise Architect (CCEA) Metaframe 1.5 and XP
Citrix Certified Instructor (CCI)
A+, Network+, Security+
Certified Internet Webmaster
Cisco Certified Network Associate (CCNA) Expired
Cisco Certified Design Associate (CCDA) Expired
Six Sigma Certified Green Belt

Abram Armijo

Los Alamos Technical Associates, Inc.
Senior Software Engineer

ROLE ON MTC SAFE FSP AVL

Vehicle System Software Development Lead

SUMMARY

Mr. Armijo is an expert in systems engineering and integration, software design and development, database design and management, and training. He has 27 years of experience developing systems and applications in the areas of telecommunications, telemetrics, aerospace, railroad, manufacturing, security, biometrics, and finance.

KEY EXPERTISE

- ✓ GPS/AVL Systems
- ✓ OSGi Framework
- ✓ Technical Analysis
- ✓ Java Technology
- ✓ Linux OS
- ✓ Eclipse Integrated Development Environment
- ✓ UML
- ✓ Agile
- ✓ SQL

PROFESSIONAL EXPERIENCE

Los Alamos Technical Associates, Inc. (LATA) *Chicago, IL* *1999 - Present*

- *Orange County Transportation Authority (OCTA), FSP / LATATrax*
  As ***Senior Software Engineer***, Mr. Armijo designed and developed a vehicle-based GPS/AVL system utilizing many years of experience working with military and commercial GPS receivers and mobile computing hardware. The embedded system uses the OSGi framework, which provides increased reliability, reduced complexity, and enhances code reuse and maintainability. Position, speed, and status information are sent to the LATA Cloud via cellular modem, and system commands, configuration settings, and code updates are retrieved from the LATA Cloud as needed. The system also serves as a mobile WIFI access point. (Helios, Agile, UML, Equinox OSGi, Eclipse, Java, Linux)

- *Maryland Transit Authority Next Train Project*
  Mr. Armijo designed and implemented a train-based GPS/AVL application. The embedded program also monitors an existing RS485 sign network and cab key position voltages to determine destination and direction. It sends status to and receives commands from a control center via wireless 3G cellular communications. (ReliaGATE, Agile, UML, Equinox OSGi, Eclipse, Java, Linux)

- *Metra GPS System Upgrade*
  Mr. Armijo designed and developed an on-board GPS/AVL, passenger announcement application to replace an outdated system. The embedded program uses train schedules and current position to play announcements, determines station arrival/departure states based on speed and location sends status to and receives commands from a land-based control center via wireless communications. (ZyWAN, Agile, UML, Equinox OSGi, Eclipse, Java, C, Linux)

- *C2 (City of Chicago Compliance and Certification FMPS Module)*
  Mr. Armijo performed technical analysis, requirements gathering, design, and implementation of integration of an existing hosted application with the City's business processes and database systems (UML, BPEL, AIM, XML, PL/SQL, Oracle 9i, and Oracle Applications)

- *Biometrics (City of Chicago Employee Time Tracking Initiative)*
  Managed the technical aspects of the installation, integration, and testing of the city's biometric time and attendance system.

- *Department of Aviation Restroom Condition Monitoring Pilot*
  Mr. Armijo designed and developed an application for a wireless restroom condition monitoring pilot system. This web-based application collects and graphically displays restroom condition data and trends, sends pages and emails to staff when restrooms require service, and manages wireless devices. (UML, Java 1.5, Oracle 10g, Oracle Application Express 2.1, HTML, Eclipse 3.1, Windows 2000)

- *Chicago Housing Authority Operations Center*
  Performed systems analysis, design, integration, development, and testing for the Emergency Services Operations Center. The systems included video surveillance (OnNet NetGuard), life safety (Andover Controls Continuum CyberStation), telephony (Cisco CallManager, IPCC Express, and TelRex CallRex), text-to-speech (AT&T Natural Voices) and a custom Java event management application developed by Mr. Armijo. (UML, Java 1.4, MS SQL Server 2000, Eclipse 3.1, Windows XP)

- *Metra Commuter Train Warranty Modification Tracking System*
  Mr. Armijo performed requirements analysis, conceptual design, detailed design, coding and testing of a warranty modification-tracking website for Chicago's Metra Commuter Trains. (UML-Use Cases, PHP 4, PostgreSQL 7, Linux)

- *City of Chicago, Mobile Inspections Unit*
  Mr. Armijo performed systems analysis, requirements analysis, system architecture design, conceptual design, and proof-of-concept of an enterprise mobile middleware server for the City of Chicago. (UML, Ianywhere Solutions m-Business Technology Platform, Apache, Jaguar)

- *Los Alamos National Bank Online Banking*
  Mr. Armijo performed requirements analysis, system architecture design, Object-Oriented software design, and development of online banking website backend replacement and enhancement task. (UML, Visual Basic 6.0, VBScript, JavaScript, Visual Interdev 6.0, HTML, ASP 3.0, COM+, Transact-SQL, Windows 2000 Advanced Server, Application Center 2000, Sybase Adaptive Server Enterprise 12.5, eToken).

EDUCATION

B.S. Computer Science, University of New Mexico, 1984

CERTIFICATIONS

Six Sigma Green Belt Certified, Villanova University, 2012
Sun Certified Programmer for the Java 2 Platform, 2000
Java Program 1.1, 1998
Oracle8: Database Administration Oracle Certified Professional

Brion Daugherty

Los Alamos Technical Associates, Inc.
Senior Software Quality Engineer

ROLE ON MTC SAFE FSP AVL

Lead role in design, construction, and implementation of test systems; creation of training manuals and maintenance procedures; and training of CHP and FSP drivers.

SUMMARY

Mr. Daugherty has over 14 years of experience working with the transportation industry providing product quality control, training, installation, troubleshooting, consulting, and management experience. He has worked on several technically complex projects for LATA including vehicle tracking using GPS, passenger information systems, on-board and platform display systems and custom information systems for the rail industry. Much of his work is in the field where he interacts directly with everyone from enterprise managers to field repair technicians.

KEY EXPERTISE

- ✓ Transit information systems
- ✓ Experience with passenger information systems and ADA compliant messaging systems
- ✓ Develop, test and train complex systems using COTS components
- ✓ Act as interface between customer and systems developers to ensure the products meet the customer requirements

PROFESSIONAL EXPERIENCE

Los Alamos Technical Associates, Inc. (LATA) *Albuquerque, NM* *2010 - Current*

- Mr. Daugherty is the ***Quality Control Engineer*** for LATA's GPS related projects. He instituted the LATA testing laboratory and is responsible for testing both firmware and software for the LATA Mobile Data System family of products. Mr. Daugherty has extensive experience using cellular technology in conjunction with location information to provide reliable data used by LATA clients to provide both visual location plotting on electronic maps and audio/visual information to rail passengers.

- Mr. Daugherty collaborated in the design of the LATA Mobile Data System, an Intelligent Transportation System applications suite for rail and bus, that includes a mobile product set and control center service, based on open systems architecture, off the shelf components, and standard commonality in interfaces and data format. He has created and introduced maintenance procedures and accompanying manuals as well as training materials for these projects.

- Orange County Transit Authority (OCTA) project

Mr. Daugherty designed, built and implemented a complete test system, the training manuals and maintenance procedures for the LATATrax projects. He trained CHP officers and Freeway FSP Drivers in the operation of the LATATrax system. He worked directly with tow truck operators during the roll out of the OCTA system, and worked directly with OCTA project leaders providing support and guidance during the LATATrax rollout at OCTA.

- Mr. Daugherty was a ***Profile Manager*** for Kinkisharyo International, LLC with full autonomy furnishing training and documentation for the Phoenix and Seattle projects in conjunction with providing customer service and on site troubleshooting and support at both locations. He authored over 2 dozen maintenance manuals, and accompanying training manuals. He facilitated training programs in classroom and on vehicles for over 50 maintenance personnel on three shifts, and educated over 20 management personnel on proper use and application of equipment.

GeoFocus, LLC *Boca Raton, FL* *2001 - 2009*

- Mr. Daugherty was a ***Project Manager*** for GeoFocus, LLC charged with conducting activities including project schedules, product planning, business planning, project mile stone adherence, timely project closure, and customer satisfaction. Provided sales engineer support to marketing department, which included sales presentations, needs analysis, preliminary system design for budgetary proposals and requirements proposals for customers.

- Formulated and incorporated customer process that included originating a maintenance business case for customers and capitalizing on additional business opportunities on currently installed products.

- Conceived and introduced training programs used to train over 100 train maintenance individuals and more than 250 TrainTrac® system users.

- Elected to serve as project manager for three major projects, which were the only profitable projects the organization recognized.

- Forged lucrative relationships with clients that enabled the gaining of over $3M in same customer sales or requests for services.

- Devised and instituted original SW testing and tracking system that improved the quality of software sent to the field and enhanced customer appreciation of the products, thus reducing the overwhelming number of complaints.

EDUCATION

B.S., Communications, University of Tennessee, 1972

CERTIFICATIONS

Certified Six Sigma Green Belt (CSSGB)

Kemal Tolga Koseoglu
Los Alamos Technical Associates, Inc.
Software Developer

ROLE ON MTC SAFE FSP AVL
Software Development

SUMMARY

Tolga has most of his history in integrating third party software with custom applications and services to improve executive decision-making. He has extensive experience in Silverlight and MVC development and advanced experience in SharePoint administration. His most recent projects are all based around HTML 5 clients, ASP.NET MVC servers, and SQL Server back-end.

Key Expertise

- ✓ Jquery, JavaScript, C#, Linq, MVC, MVVM, T-Sql, knockoutjs, signalR, software patterns, json
- ✓ Visual Studio, SQL Server, Windows

PROFESSIONAL EXPERIENCE

Wimberley Allison Tong & Goo *Irvine, CA* *2005 - Present*
SharePoint, Silverlight, ASP.NET Web Development

- I am the sole responsible person for custom application development and software integration.
- My main tasks are maintaining, administration and developing against SharePoint 2007 and developing Silverlight applications.
- Other daily technologies/software I work with are SQL Server, T-SQL, Web Services, WCF, WCF RIA, API integration.

Los Alamos Technical Associates *Albuquerque, NM* *2010 - Present*
ASP.NET MVC, SharePoint, Silverlight Consulting

- LMDS application for Chicago railroad authority Metra.
- Upgrading existing Warranty tracking application.
- Developing custom deployment tools and software.
- In-house financial forecasting application.
- OCTA FSP (Orange County Transportation Authority, Freeway Service Patrol)

- MTA (Baltimore)

PMC Solutions Inc. *Albuquerque, NM* *2010 - Present*
Silverlight Development, Consulting

- Re-write of company's major software product. Process mapping and documentation.
- SQL Server back-end.
- Silverlight 4 front-end.

Bankruptcy Management Consulting *El Segundo, CA* *2004 - 2005*
Junior Level .NET Developer

- Custom web tool
- SharePoint customization
- Internal utility applications

EDUCATION

Texas A&M University *College Station, TX* *2004*
Bachelor of Business Administration – MIS, Cum Laude

CERTIFICATIONS

Six Sigma Green Belt (SSGB)

Vasu Pillalamarri
Los Alamos Technical Associates, Inc.
GIS Engineer
(951) 315-7342, vasu@infowhere.com

ROLE ON MTC SAFE FSP AVL
GIS Engineer

PROFESSIONAL EXPERIENCE

InfoWhere Inc. *Redlands, CA* *2011 - Present*

- As ***Chief GIS Officer & Engineer***, Mr. Pillalamarri developed GIS Analytics for LATATrax Freeway Service Patrol applications using ArcGIS Desktop, Server and ArcGIS Online

- He leads GIS projects selecting the right mix of GIS and database software for the project and works with our desktop FusionWhere GIS software in addition to developing server-based GIS applications. Geodatabase and GIS server solutions developer for transportation customers including Orange County Transportation Authority (OCTA)

- He develops Geographic Information System (GIS) application solutions based primarily on Esri desktop, server and online software

PCI Geomatics USA Inc. *Redlands, CA* *2010 - 2011*
Senior Technical Architect /Product Marketing Manager,

- ***On site coordinator*** of software development and sales for PCI Ge omatics

- ***Product Manager*** for PCI's GeoImaging Tools for ArcGIS, providing satellite and aerial imagery correction within a GIS framework

- Mr. Pillalamarri was the PCI ***Project Lead*** for joint project with Esri to host advanced image processing capabilities on the Amazon Cloud

- He was a ***Key member*** of the GeoImaging Accelerator (GXL) technical team developing and demonstrating high speed imagery orthorectification and mosaicking in an NVIDIA CUDA processing environment

- Mr. Pillalamarri worked closely with Esri technical staff to implement features in PCI's image processing software with interfaces that are familiar to GIS users

Western Riverside Council of Gov. *Riverside, CA* *2006 - 2010*
Senior GIS Analyst

- Mr. Pillalamarri maintained and updated spatial layers for transportation and environmental planning, he performed data modeling and integration with spatial data and Remote Sensing using 3D and Spatial Analyst

- He assisted in the coordination of vector and Remote Sensing data collection using ArcGIS, Google Earth, ER Mapper, and IDRISI software suites

- He utilized ArcGIS suite to perform GIS and remote sensing analysis, design and prepare maps and imagery overlaysMr. Pillalamarri prepared Technical documentation and procedures of database programs, administered, created, and maintained Agency's SQL Server RDBMS
- He also administered and modified Agency's Web applications

Southern CA Association of Governments *Los Angeles, CA* *2006 - 2006*
Senior GIS Specialist

- Developed and implemented GIS-based planning applications
- Provided support to mapping productions
- Installed and updated GIS software including ArcGIS, TranCAD, ErMapper and Google Earth
- Develop and implemented improvements for internet mapping applications for ArcIMS
- Conducted GIS-based analysis such as Trend Analysis, Spatial Forecasting and Population
- Mapping with Remote Sensing applications
- Identified and reported on project performance indicators
- Used Oracle and SQL Server to manage, extract, clip, and mosaic raster and Remote Sensing data

Forma Design Inc. *Irvine, CA* *2006 - 2006*
Senior GIS Analyst

- Worked as a project manager to create and maintain Real Estate Development and Land Use Maps
- Assisted senior management with using GIS maps to make business decisions
- Managed a team of 5 employees to work with various clients on GIS projects
- Assisted in preparing Specific and Land use Development Plans

Esri *Redlands, CA* *2001-2006*
Senior Software Support Analyst

- Provided technical support to government and private sector clients on a variety of GIS and remote sensing issues including: Spatial Analysis, 3D Analysis, Metadata, ArcInfo Desktop, ArcSDE, ER Mapper, Raster analysis, DEM Extraction, Raster Classification, Moasicing, Color Balancing, Data Conversion and CAD
- Designed RDBMS for ArcSDE using Oracle and SQL Server

EDUCATION

Bachelor of Science in Chemistry with an emphasis in Environmental Studies
Bachelor of Science in Geographic Information Systems, Rowan University, 2001
Masters of Science in Computer Information Systems, California Polytechnic Institute, 2005

COMPUTER CERTIFICATIONS

Esri ArcGIS1 and 2, ESRI managing and creating geodatabases 1 and 2, ESRI Introduction to ArcSDE, ESRI Managing ArcSDE environments, Working with Spatial Analyst/Raster Data, Working with 3D Analyst, ESRI Data Interoperability Extension, Geoprocessing in ArcGIS

CLAY RARDIN

Los Alamos Technical Associates, Inc.
Senior Software Engineer
(505) 385-5264, crardin@infowhere.com

ROLE ON MTC SAFE FSP AVL
GIS Engineer

SUMMARY

Clay Rardin is a seasoned professional software engineer with 10+ years of experience. His application development experience includes working with multiple geospatial platforms such as Esri's ArcGIS system and Google Maps. He is the lead developer for the FusionWhere desktop GIS product, which is used to develop freeway GIS infrastructure and communicate with the LATATrax Cloud servers. He has extensive experience in working with GIS application program interfaces (APIs) and software development kits as part of InfoWhere's rapid prototyping and agile software development processes.

PROFESSIONAL EXPERIENCE

InfoWhere Inc. *Albuquerque, NM* *2013 - Present*
Senior Software Engineer

- GIS software development for FusionWhere add-in to ArcGIS Explorer
- Work with various Esri web APIs to create applications
- Created website for City of Chicago with map interface to Socrata and Oracle data.
- Enhanced an add-in to ArcGIS Explorer with improved geospatial capabilities and connections to SQL Server for near real time and historical data operations.
- Installed and administered an ArcGIS server running on Oracle 10g.
- Installed and administered a PostGIS/Postgresql server.
- Maintains InfoWhere website.

MEI Technologies *Albuquerque, NM* *2010 - 2012*
Analyst IV

- Data Analysis for ACE Event 2011.
- Designed and coded SSA tool (in Python) to track signal-to-noise return from a satellite.
- Coded several scripts (in Matlab) for batch analysis of laser beam propagation effects.

Schafer Corporation *Albuquerque, NM* *2008 - 2010*
Engineer/Scientist III

- Acted as administrator for Oracle 9i database.
- Created coolant system design tool using VBA and Visio 2000.

Geospace, Inc. *Albuquerque, NM* *2007 - 2008*
Technical Infrastructure Manager/Software Developer

- Programmed (in C#) with Geopsace team to produce the GIST geospatial viewer for image analysis and manipulation.
- Set up entire business website for Geospace, including integration into online licensing registration and Salesforce management.

Boeing-SVS *Albuquerque, NM* *2001 - 2007*
Engineer/Scientist II

- Lead System Engineer for Payload System Engineering for Tactical Relay Mirror System (TRMS) Project.
- Installed and administered DOORS (7.0) database for the Boeing-SVS organization.
- Wrote in excess of 100 scripts in DXL to enhance DOORS use at BSVS.
- Designed and coded (in ASP) interactive web-based tool for tracking staffing needs at Boeing-SVS.
- Served as the Boeing-SVS web master.
- Designed web spider agent (in Java) using UML techniques that delivered its data via sockets to a C++ based program.
- Created several Bash and Perl scripts to aid in administrative tasks on the job.
- Served as a data operator for Advanced Tactical Laser (ATL) HELfire testing.

Boeing-SVS *Albuquerque, NM* *2000 - 2001*
RHIC Consultant

- Created and modified JSP pages for eMatrix configuration management tool.

EDUCATION

Master's Certificate, System Engineering, Air Force Institute of Technology (in process)
Bachelor of Science, Physics, New Mexico Tech, Socorro, NM. 1997

COMPUTER SKILLS

Computer Languages: Python, Ruby, C#, Java, Perl, DXL, Visual Basic, AJAX, C/C++, Tcl/Tk, Scheme, Objective C
Databases: Oracle (10g and 9i), PostgreSQL, mySQL, MS SQL Server (2000, 2005, 2008), and general database design theory. Administration of spatial database systems including PostGIS and ArcSDE geospatial database on Oracle 10g.
System Design: UML 2.0, Enterprise Architect.
Analysis: Matlab, Excel, R, numpy, scipy.
Web: IIS, Apache, JSP, PHP, ASP, ASP.NET, XHTML, CSS, Javascript and CGI. Experience with DreamWeaver CS3.
OS: Linux, Unix, Windows and Macintosh platforms.
ArcGIS for Server and ArcGIS Online, with experience in related SDKs and APIs.

CERTIFICATIONS & TRAINING

Using DOORS for Requirements Management, 2004 contact hours: 40
DOORS Administration and Management, 2004 contact hours: 40
eMatrix User Course, 2004 contact hours: 40
eMatrix Administrator Course, 2004 contact hours: 40
Administering Pro/Intralink, 2004 contact hours: 40
Oracle 9i Database Administration Fundamentals I, 2005 contact hours: 40
Oracle 9i Database Administration Fundamentals II, 2005 contact hours: 40
Oracle 9i Database Performance Tuning, 2005 contact hours: 40
Matlab Fundamentals and Programming Techniques, 2006 contact hours: 40
Advanced Matlab Programming Techniques, 2006 contact hours: 40
Writing Better Requirements, 2006 contact hours: 16

Appendix 2 – Sample Technical Reports

1. FusionWhere User Guide
2. LATATrax Drivers Guide
3. LATATRAX Map Quick Start User Guide

FusionWhere User Guide
for
Orange County Transportation Authority

Version 1.0
July 2013

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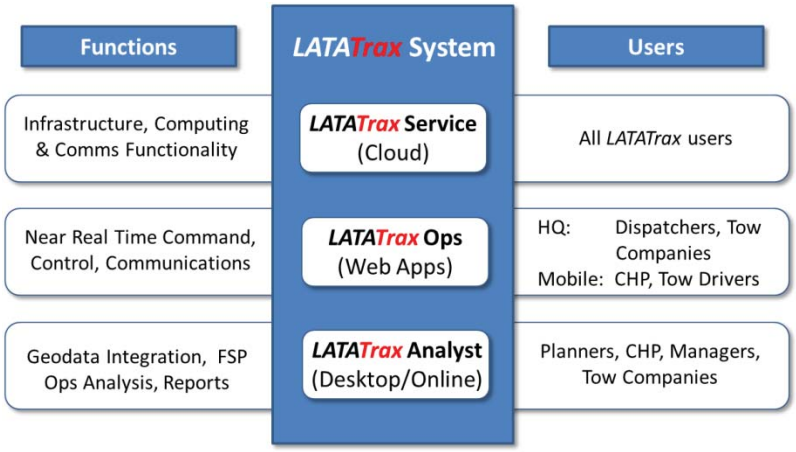
1.0 Introduction to FusionWhere™ LATATrax Edition

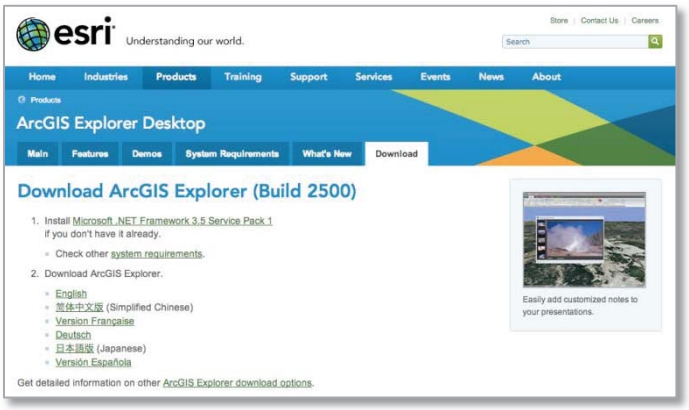
FusionWhere is a key component of the Geographic Information System(GIS) solution developed for the Orange County Transportation Authority (OCTA) to use in managing their Freeway Service Patrol (FSP) program.
FusionWhere is an "Add-In" to Esri's ArcGIS Explorer (AGX) Desktop software developed by InfoWhere Inc. (http://www.infowhere.com). Both ArcGIS Explorer and FusionWhere are designed to be powerful, but very easy to use applications that are suitable for users who do not have an extensive background in Geographic Information Systems (GIS). Many of the most commonly used features of ArcGIS Desktop, which is used by most GIS Professionals are replicated in ArcGIS Explorer in a less complex form. Whenever Esri provides updates to AGX, InfoWhere will perform compatibility testing and issue FusionWhere updates as needed to work with the latest version of AGX. InfoWhere is a member of the Esri Partner Network and maintains direct relationships with the Esri AGX team, which facilitates the FusionWhere updating process.



FusionWhere is the primary desktop tool in the LATATrax Analyst suite and provides a number of capabilities not resident in AGX including tools that provide two way communications between AGX and servers and databases in the LATATrax Cloud. FusionWhere provides the ability to download from the Cloud geographically referenced shapes (polygons) and descriptive data for freeway beats, segments, drop zones, tow truck yards and call boxes. FusionWhere also allows the user to edit, add to or delete the data and then upload the changes to the LATATrax Cloud.
Besides allowing users to modify geographic information and descriptive data, FusionWhere provides an environment for viewing and interacting with LATATrax analytics. Historical Freeway Service Patrol data that is stored in LATATrax geodatabases is processed using ArcGIS Desktop and other software and is then imported into FusionWhere (usually as an Esri layer package) for viewing and integration with other geodata.

2.0 Installing ArcGIS Explorer

ArcGIS Explorer Desktop must be installed before FusionWhere can be installed as an Add-In. Instructions for installing AGX are provided at the following Esri website: (http://www.esri.com/software/arcgis/explorer/download). The website also provides descriptions of AGX capabilities, software demonstrations and hardware requirements for running AGX.
Due to the .NET requirement, AGX cannot be installed on Mac's unless you are running Boot Camp (a native Mac capability) with Windows installed, or are using a virtual machine (VM) solution such as Parallels or VMware that has Windows installed. Typically the performance is better running Windows in Boot Camp compared to using a VM.



2.1 Installing AGX from the Esri Website

2.1.1 First Install Microsoft .NET Framework 3.5 Service Pack 1. The link for .NET Framework download takes you to a Microsoft Download Center. Follow the directions and download by clicking on the link titled "Microsoft .NET Framework 3.5 Service Pack 1". The link will take you to a page where you will select "Download". Depending on your web browser, you will see the file "dotnetfx35.exe" being downloaded. The file is over 200MB, so may take a couple of minutes to download. Once the download is complete, run the installer.

2.1.1 While the Esri website specifies .NET Framework 3.5 Service Pack 1, InfoWhere has experienced no problems in using later releases.

2.1.1 Once the .NET installation is complete, go back to the Esri website and click on "Check other system requirements". This will take you to a page where you can determine if your computer's software and hardware is compatible with AGX.

2.1.1 Go back one page and click on "2. Download ArcGIS Explorer, English. Just follow the directions on your screen to complete the installation.

2.1.1 Once the AGX installation is complete, return to the Esri web page again and click on "Get detailed information on other ArcGIS Explorer options". This will take you to a page where you can download Expansion Packs and a Help file. It is recommended that all of the AGX Expansion Packs be downloaded and installed:

1.1.1.1 Data Access Expansion Pack
1.1.1.2 Fonts Expansion Pack
1.1.1.3 Projection Engine Expansion Pack

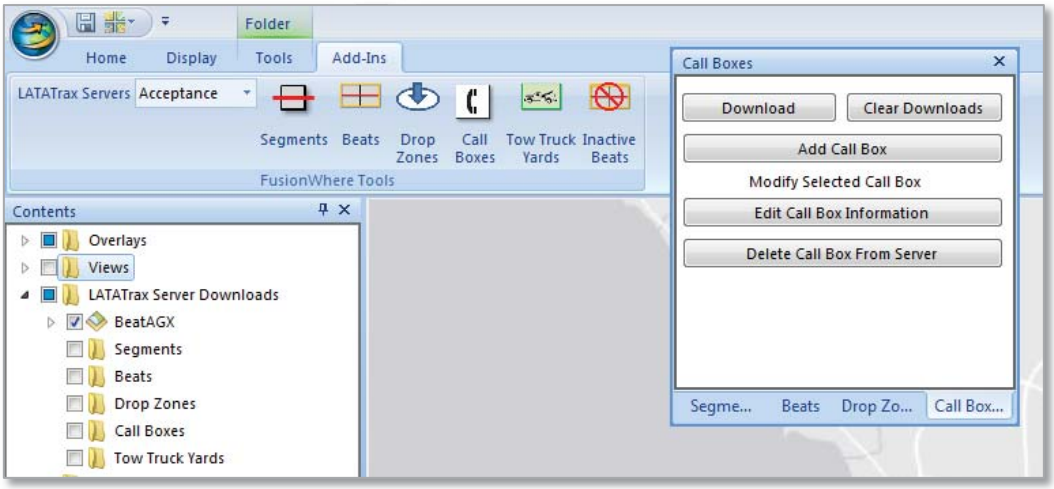
2.2 Installing AGX from the LATATrax Drop Box Site

To simplify the installation process all of the .NET and Esri files needed to install AGX are made available in a Dropbox folder that can be accessed after creating a drop box account for the user. The account is free and once established, the user should contact LATA or InfoWhere to have access to the installation folder authorized. A "Getting Started" file is included in the folder that explains the sequence for installing the .NET framework, AGX and FusionWhere. The sequence is the same as for installing from the Esri website, but is somewhat easier since all of the files are in one location. The files that are needed are in a folder titled "FusionWhere Standard Install".

3.0 Installing FusionWhere

Once you have AGX installed, you are ready to install FusionWhere LATATrax Edition as an "add-in". Installation is simple. Close AGX and double click on the FusionWhere installer icon that you have loaded to your hard drive (from Dropbox or other sources), or have available on an external drive. FusionWhere will install in a couple of minutes and place a FusionWhere shortcut on your desktop.

When you next start AGX you will find that new tools have been added to the main menu in the "Add-Ins" tab on the main AGX toolbar. The FusionWhere tools provide functionalities that are not native to AGX. The following tools are added:

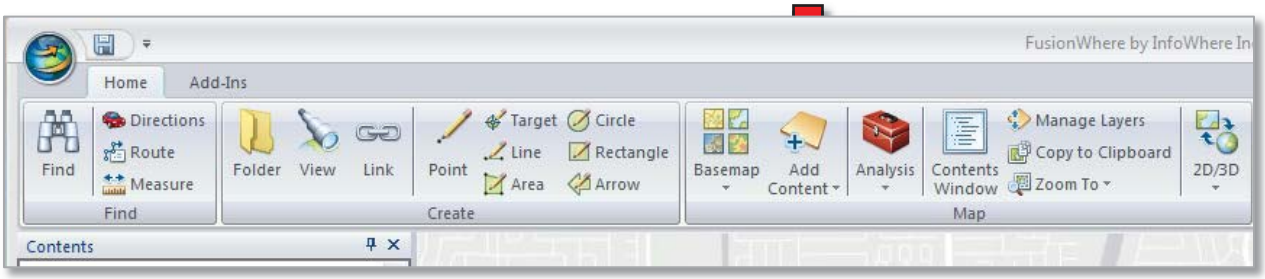


- LATATrax Server Selection Tool
  - Allows FusionWhere to be connected to LATATrax servers such as Production, Acceptance and Development for data exchange purposes
- Segments Tool
  - Allows the user to create, edit and delete segment polygons (used to divide freeways into segment "building blocks" that can be used to build patrol Beats.
- Beats Tool
  - Used to construct Freeway Service Patrol beats using segments stored in the LATATrax databases. Beats
- Drop Zones Tool

    - Allows the user to draw polygons (using AGX drawing tools) that designate drop zone areas for towed vehicles.
- Call Boxes Tool
    - The interface allows the user to input call box data and have it displayed on the map
- Tow Truck Yards
    - Similar to Drop Zones, except that the polygons mark tow truck yard boundaries
- Inactive Beats
    - Beats are not generally deleted from the databases even after they have expired due to potential value in analyzing historical data. Using the Inactive Beats tool, the user can reinstate an inactive beat without having to go through the normal process of building the beat from scratch using the Beat tool.

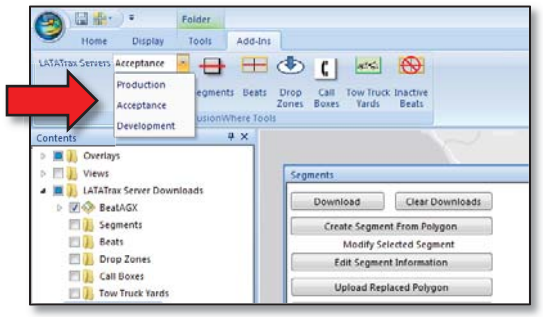
4.0 Configuration

Once AGX and FusionWhere are installed, the user is able to connect to external data sources. AGX provides easy access to local and web Geographic Information System (GIS) data sources using the "Add Content" button on the Home toolbar. As part of the configuration process, InfoWhere provides a folder of GIS data that is applicable to LATATrax for OCTA. This LATATrax Geodata folder is contains ArcGIS layer packages for freeway segments, an AGX map file (.nmf suffix) with OCTA freeway data, and other data of interest. It is best to use the supplied AGX map file (or another one of your making) for LATATrax data operations rather than adding data to the "Default" map. If AGX becomes corrupted and has to be reloaded, a new, blank Default map will be installed and the old Default map file containing your data will be overwritten. That's a bad thing. Using a separate file ensures that you will not lose data if it is necessary to reinstall AGX. That's a good thing.



If/when you install data from the LATATrax Geodata folder (or other folders for that matter), AGX will save the file location data as part of the AGX map file. If you subsequently move the data to a new location, AGX will show error messages the next time you open the file, but will give you an opportunity to "repair" the links. As long as you remember where you moved the data to, there won't be a problem reconnecting.

5.0 FusionWhere Connections to LATATrax Servers



FusionWhere has been customized to connect to the LATATrax SQL Server that hosts the Freeway Service Patrol (FSP) LATATrax Service software. This LATATrax Service software supplies vehicle location data, alerts and administrative information to the LATATrax Operations module that provides users with a web map, management and dispatching functions. In addition to the "Production" SQL Server that users connect to via the Internet, there are also "Acceptance" and "Development" SQL Server versions. FusionWhere can connect to all of these.

Uploading to SQL Server. In general, polygons (e.g., freeway segments, drop zones, tow truck yards) are created in FusionWhere using drawing tools supplied by both AGX and FusionWhere, and are then uploaded to SQL Server for storage in the Microsoft SQL database and use by the LATATrax Service software. To confirm that polygons created in the desktop environment display properly on the LATATrax web map, the new data may be first uploaded to the Acceptance server (which runs its own version of the LATATrax Service) to verify that there are no issues. If all is well, the new polygon data can be uploaded to the Production Server for consumption by all LATATrax users. When data is uploaded to the Production Server, it is also simultaneously uploaded to a geodatabase that is served to the LATATrax web map.

Downloading from SQL Server. FusionWhere maintains an online connection to SQL Server (pick the one you want) and allows users to refresh their desktop with the latest location and description data for beats, segments, drop zones and call boxes that are stored in SQL server. Since there may be multiple personnel using a copy of FusionWhere at any time, it is best to have SQL Server provide the latest information stored in the master SQL database. The information for the downloaded polygons and points is shown in the Contents column on the left of the AGX screen in the same manner that locally generated GIS data is shown. A user who uploaded data to SQL server may chose to delete their local data once it has been confirmed that the data is alive and well in the SQL database. The uploaded and downloaded data will be in separate folders in the Contents column, so it's up to the user if they want to keep both versions.

6.0 Using FusionWhere™ LATATrax Edition

While FusionWhere enhances the basic capabilities of ArcGIS Explorer, the LATATrax edition is primarily intended to provide functionality needed to author and edit geographical features (e.g., polygons) and associated information for the Freeway Service Patrol application. The essential functionality needed for this purpose is discussed in this section. Detailed descriptions of procedural steps are not included, as videos are used to supplement this user manual. Key functions to be discussed are how to create, edit and delete:

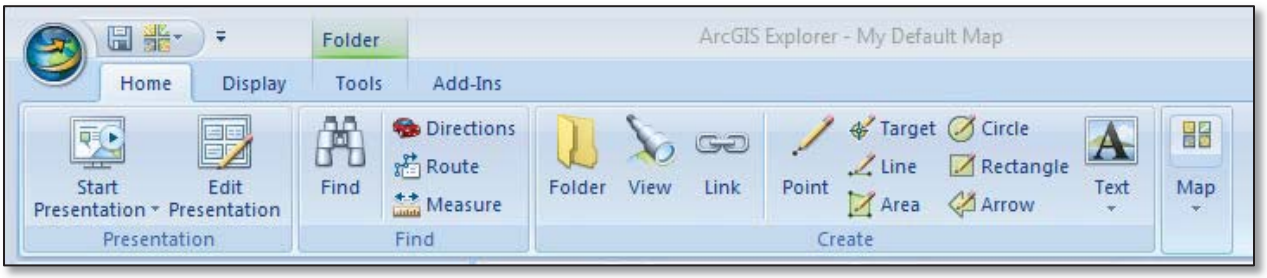
- Segments
- Beats
- Drop Zones

- Tow truck yards
- Call boxes

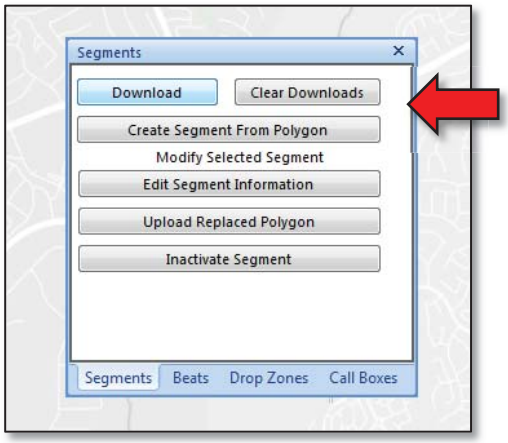
The FusionWhere Tools for these functions have a consistent look and functionality. Each includes buttons for “Download” and “Clear Downloads”. “Download” causes selected information (e.g., segments) to be downloaded from the LATATrax server to which the user has connected FusionWhere and to be displayed in the Contents window on the desktop in a sub folder (in this case titled “Segments”) within the “LATATrax Server Downloads” folder.

6.1 Creating and Editing Segments

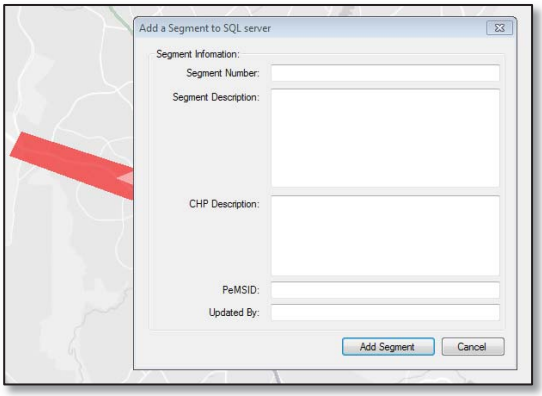
Segments can be created by using the “Area” drawing tool on the AGX Home menu. Generally it is best to first select a satellite map view from the map collection (accessible using the Basemap



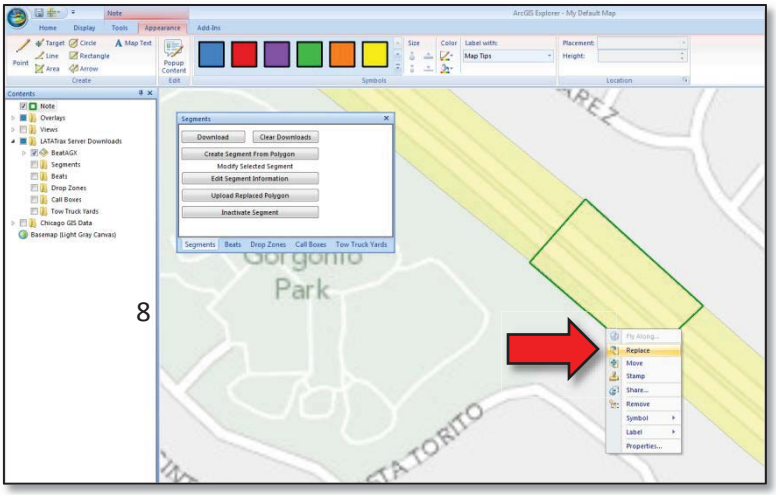
tool on the Home menu) to view the freeway area that will be divided into segments.



Once a Segment polygon has been drawn, click on “Create Segment from Polygon”. At that point a dialogue b[illegible]ll appear that will allow the user to input information related to the Segment.



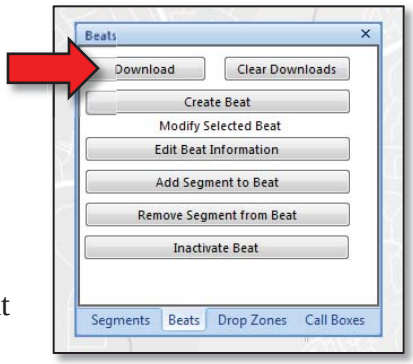
The Segments tool can also be used to edit segment description information by clicking on “Edit Segment Information”. In order to change the segment polygon’s size, shape or location it is necessary to use the AGX “Replace Polygon” tool. Right clicking on the segment



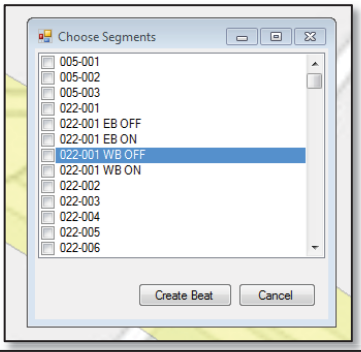
to be changed exposes the “Replace” function. Once “Replace” is selected, the polygon is highlighted and the cursor changes to an “X” allowing the user to redraw the segment polygon. Once the new segment shape is completed, the user clicks on the Segment Tool selection, “Upload Replaced Polygon” and the new shape is uploaded to the LATATrax SQL server to which FusionWhere is connected at that time. The segment description information is not changed and remains associated with the revised segment polygon.
The Segment Tool interface also includes an “Inactivate Segment” function that essentially deletes the selected Segment polygon from the map.

6.2 Creating and Editing Beats

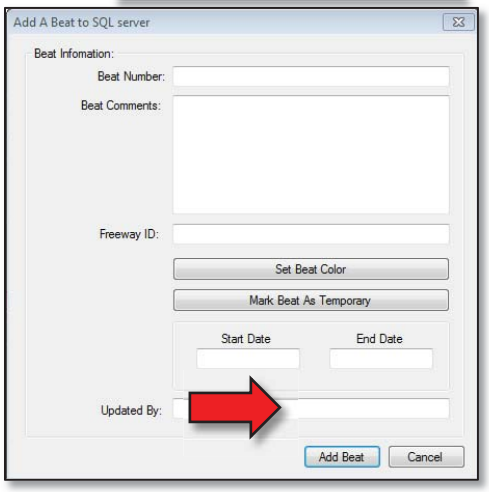
The Beat Tool is used to create freeway patrol beats from segment polygons that delineate portions of the freeway. In order to construct a beat:



- The user should first activate the Segments Tool and click on “Download” to obtain the latest segment information from the server. The segments will be listed in the Contents window (default location is the left side of the screen) in a folder titled “Segments”, which is a sub-folder within the LATATrax Server Downloads folder.
- Next activate the Beats Tool and select “Create Beat”. At that point a dialog box will pop up that is titled “Choose Segments”



- Click on the names of the segments that are to be included in the new beat. The selected segments will be highlighted on the screen to help the user confirm that the desired segments have been selected
- Once all segments for the beat have been selected, click on the “Create Beat” button on the “Choose Segments” interface. That will result in a window popping up to allow the user to input descriptive information about the new beat such as beat number, freeway and start/end dates for the beat being in service.

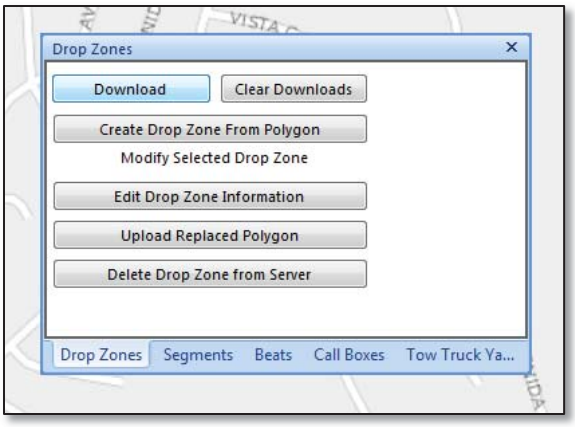


- Upon clicking on “Add Beat” the beat will then be automatically uploaded to the LATATrax server to which FusionWhere is currently connected and to the LATATrax geodatabase. The beats folder in the Contents window will be automatically refreshed and the new beat will be displayed in the Beats folder.
- Existing beats can be edited using the Edit Beat Information Tool to modify text/descriptive information about the beat, and the Add Segment to Beat Tool to add additional segment polygons to the beat. The interface is implemented the

same way as the ” Choose Segments” function, except that the pop up box is titled “Add Segment to Beat”.

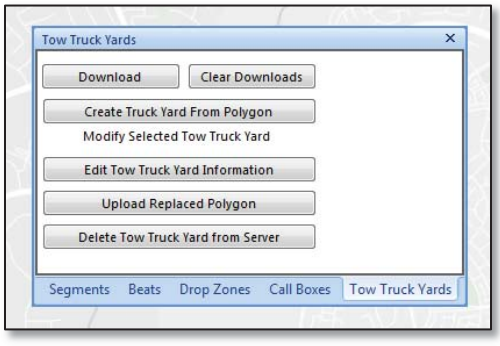
- The Beats Tool uses a similar process to remove segments from beat.
- Using the Beats Tool, the user can select a beat and then click on “Inactivate Beat” to remove the beat from service and from the screen. To reactivate the beat, the user must go to the Add-Ins tab on the ArcGIS Explorer menu bar and select “Inactive Beats”. A list of Inactive Beats will appear and the user must check on the beat to be reinstated and then click on “Activate Selected Beat”. The beat will be reactivated with the last beat settings input into the database. It is recommended that the user confirm that the beat information is still appropriate and then use the Beats Tool to edit segments or descriptions if necessary.

6.3 Creating and Editing Drop Zones



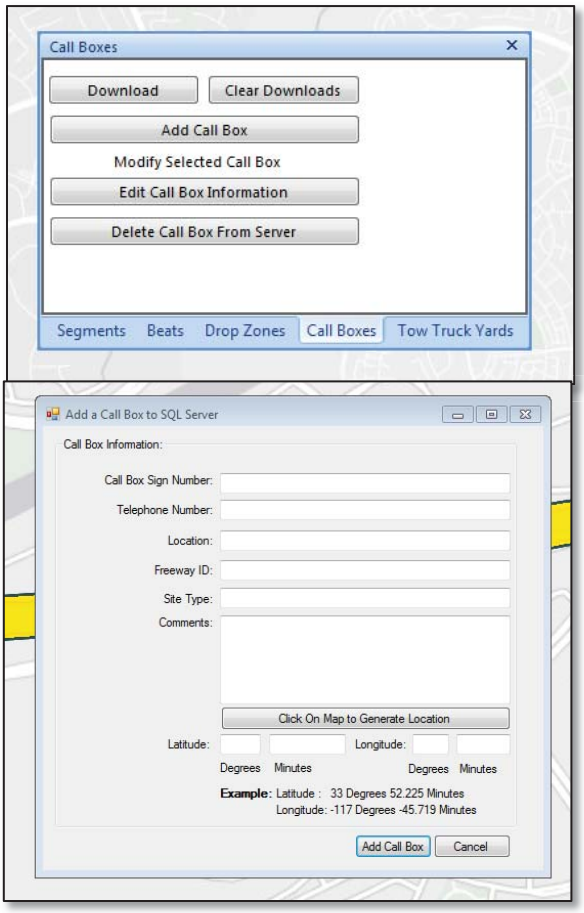
The user can add, edit and delete drop zones using the ArcGIS Explorer Area tool to draw the drop zone shape and the Drop Zones Tool to add descriptive information and exchange drop zone information with the LATATrax servers. As with the other FusionWhere tools, the user can click on “Download” to have the information currently stored in the SQL server database downloaded to the desktop and displayed in a folder (in this case labeled “Drop Zones”) in the Contents window. The functionality for creating a drop zone, editing existing descriptive information, replacing the polygon using the “Replace” function is the same as for the Segment Tool, except that the polygons are drop zones vice segments. If a drop zone is deleted using the “Delete Drop Zone from Server” function, it will be erased from the SQL database and cannot be reactivated. If the user wants to utilize the drop zone after having deleted it, it is necessary to recreate the drop zone from scratch.

6.4 Creating and Editing Tow Truck Yards



The functionality for creating, editing and deleting Tow Truck yard data is the same as for Drop Zones, except that the Tow Truck Yards Tool is utilized. When the user creates a tow truck yard polygon, it is recommended that a satellite or aerial imagery base map be selected and that the display is zoomed in to high resolution before drawing the polygon. Tow truck yards that have been created will be shown in the Tow Truck Yards folder in the Contents window whenever “Download” is clicked on the Tow Truck Yards Tool.

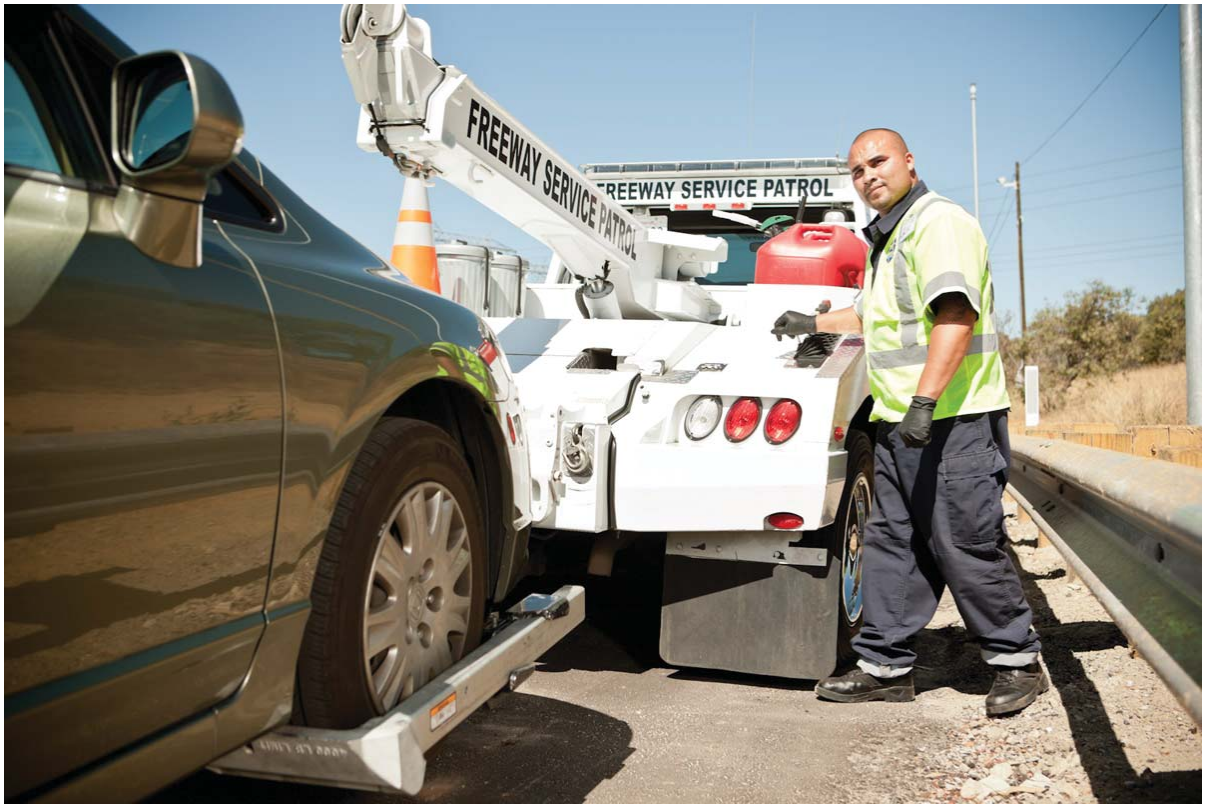
6.5 Creating and Editing Call Boxes



The Call Boxes Tool is provided to allow the user to create call box locations, add descriptive information, edit the data and delete a call box from the server. Call boxes are tracked in the database using the call box Sign Number.

To add a call box, the user must click on "Add Call Box" on the Call Boxes Tool interface. A dialogue box titled "Add a Call Box to SQL Server" will appear that has fields that the user can fill in to identify the call box and specify its location. Call box locations can be selected by using the "Click on Map to Generate Location" function or by manually inputting the latitude and longitude of the call box. It is important to use the latitude and longitude format shown in the pop up box, paying attention to the minus sign in the Longitude field and the use of decimal minutes. The user may need to convert location data that is received from outside sources to this format.

To edit a call box, click on "Edit Call Box Information" and a dialogue box that looks the same as the "Add a Call Box to SQL Server" box will appear. Location and descriptive data can be edited in that window.



LATATrax Driver's Guide

A Driver's view to the LATATrax User Interface

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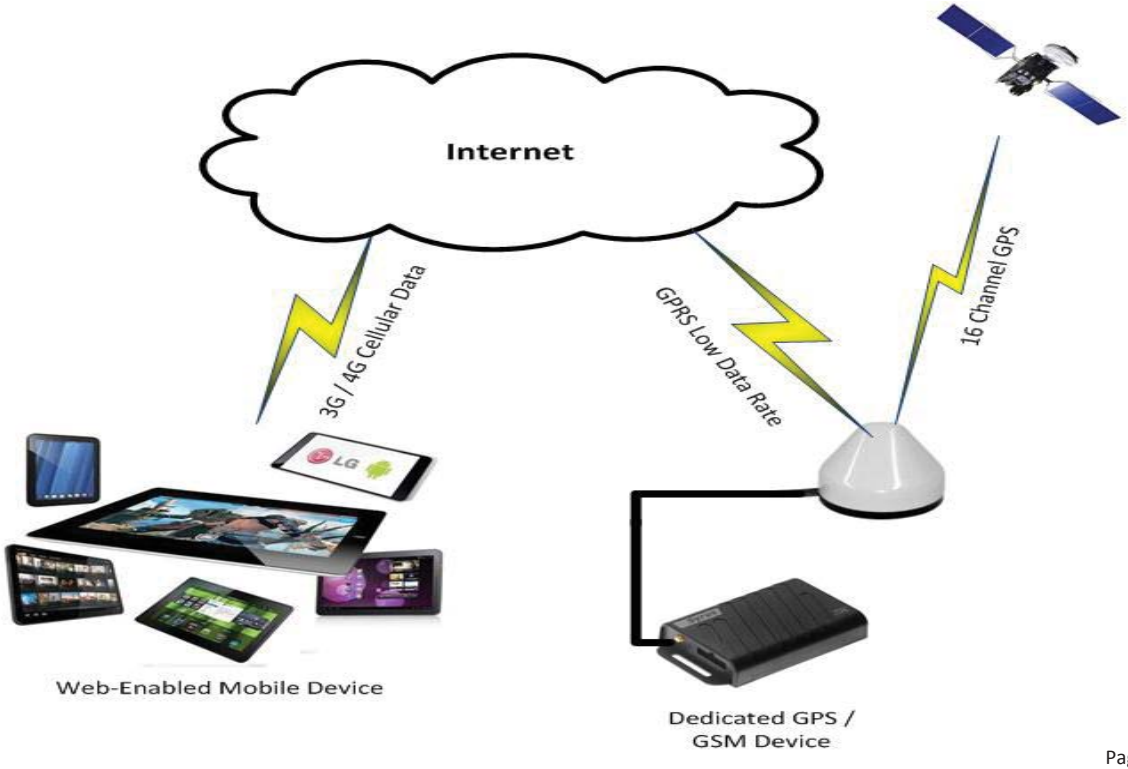
1. LATATrax Web Site

The LATATrax Driver's system is made up of several main components. The first component is equipment mounted onboard the Vehicles, as described in the "*On Vehicle Equipment*" guide. The equipment on the Vehicles provides vehicle location information, current speed, maximum speed achieved, and other information required by the system is gathered from an onboard LATA Terminal Computer (LTC). The LTC is responsible for obtaining information from dispatch, the driver, and the Highway Patrol. It also acts as a Wi-Fi hot spot allowing communications between the LATACloud and the tablet computer mounted in the Vehicle cab. This information that is gathered is transmitted to the Hosted Central Environment using its internal modem to communicate with the LATACloud. A full description on the LATACloud is found in the manual called "*Hosted Central Environment*."

The second component is the LATACloud for serving up the browser based Web site and database management. The LATATrax Web site allows the California Highway Patrol (CHP) Officers, Freeway Service Provider (FSP) Dispatchers and Managers, along with Contracted Vehicle Companies to see where their Vehicles are in near real time (sub-second). Dispatchers use the Web site to dispatch Vehicles to incidents and manage the proper distribution of services to motorists. The dispatch information is sent to the Vehicle via the LATACloud where it is acknowledged by the driver via the on-board mounted tablet. This full process is described in the "*Dispatching and Service Tracking*" module of this User's Manual.

Each vehicle will have some selection of three components major pieces of equipment, as shown below, installed: a tablet, a computer device, and an antenna, on the vehicle even though the only visible part is the tablet.



This module is concerned only with what the Vehicle Driver is required to know to operate their portion of the LATATrax system and is fully describe in this document. The table of contents in this module provides an outline of the areas covered. The Vehicle Driver **MUST KNOW** the material contained in this guide to operate LATATrax properly. A web enabled tablet is required (in this documentation we use the Apple iPad). A modem connection to the internet via a carrier such as AT&T, Verizon, or other such company is also required. The dedicated computing device is shown as a small black box, labeled "Dedicated GPS/GSM Device," and can, like the tablet, be from any one of a number of manufacturers. There is also an antenna mounted to a high point on the vehicle's exterior and improves the signal strength of Wi-Fi, cellular, and global positioning satellite signals; this too can be obtained from any one of several manufacturers.

2. Tablet Wi-Fi Setup

The driver's first step in using the LATATrax system is to location the Vehicle's Wi-Fi broadcast name. A label is typically placed on the Vehicle cab's rear view mirror that will identify the Wi-Fi name for that Vehicle.

The driver must connect the tablet to the Vehicle Wi-Fi signal before any other step may be taken with operational success. Vehicle Wi-Fi broadcasts are individually named as part of the Implementation Teams requirements, not two vehicles Wi-Fi will have the same name. Each organization will choose their own naming convention that makes sense to their organization. For the purposes of this manual we will be using a supposed set of 55 Vehicles named OC_01 through OC_55. Every vehicle will have its own unique Wi-Fi identification, again, found on the rear view mirror or other predominate location easily visible in the cab from the driver's seat. Please take the time now to locate the Wi-Fi name tag.

Special notes are made in this documentation such as the one below. The following note is not only an example but is also a true and required step to properly setting up the LATATrax Driver's Connection to LATATrax. LATA places notes of this kind in the documentation to bring attention to critical items.

Note 1

*The Vehicle **must be running** for at least five minutes before trying to connect to the Wi-Fi. The LTC computer that gathers GPS location information, communicates with the LATATrax LATACloud servers, and handles the Wi-Fi signals takes about 4 or 5 minutes to boot up and complete all its required connections before the Wi-Fi can be accessed. Use this time to locate the Wi-Fi name for this vehicle.*

After the vehicle has been started the driver must turn on the tablet mounted in the cab and take time to make sure special setting are correct on the table before continuing. These settings are found in Appendix A of this manual and are subject to changes. As soon as the tablet is up and running shown by the appearance of the "Home" screen. Take the action steps outlined in "Action Steps I."

Figure 1 "The Settings Icon"

Action Steps I

What you do	What Happens
1. Start by touching the "Settings" icon on the iPad screen (it will look something like figure 1). See **Figure 1 The Settings Icon.**	This will open the Settings screen.
2. Touch the Wi-Fi button on the left side of the screen under "Settings". See **Figure 2 Logon to Vehicle Wi-Fi.**	The Wi-Fi panel is displayed on the right portion of the screen.
3. Verify the Wi-Fi is turned on. Touch the "Off" button to turn the Wi-Fi on if necessary.	Turns the Wi-Fi feature of the iPad on as seen in Figure 2.
4. Touch the Wi-Fi name for your Vehicle (for example, OC_51). Every Vehicle is different you'll need to know your Vehicle's Wi-Fi.	The tablet will start the connection to the Wi-Fi process. The Wi-Fi password challenge screen will appear.
5. Enter the Wi-Fi password, it should be supplied to you by your system administrator.	A check mark will appear next to the Vehicle's Wi-Fi name in the network list when the connection is complete.

The Action Steps I must be performed each time the drivers begins operation of the vehicle to insure the tablet is connect to the correct Wi-Fi broadcast. Any Wi-Fi broadcasts within approximately 50 to 100 feet of a Wi-Fi station can potentially be connect to. The vehicle is actually one of these Wi-Fi stations. There may be many Wi-Fi signals near the vehicle being operated within the 50 to 100 foot radius. It is critical to be connected to your vehicle's Wi-Fi and not the vehicle next to you or any other signal.

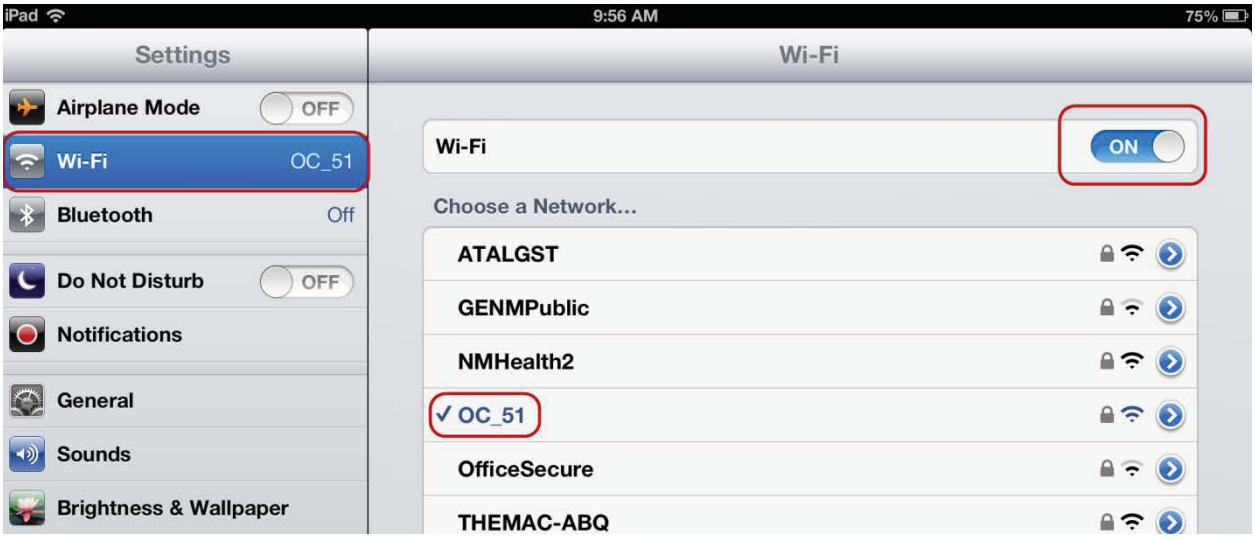


Figure 2 Logon to Vehicle Wi-Fi

Action Steps II

What you do	What Happens
6. Press the iPad "Home" button. See **Figure 3 iPad "Home" Button.**	Returns to the home screen.

Figure 3 iPad "Home" Button

3. Using the LATATrax Driver Screens

The LATATrax driver screens allow a driver to do the following:

- Logon / Logoff –the LATATrax system.
- Roll Out / Roll In – from or to the yard.
- Signal – Break time.
- Signal – Lunch time.
- Create – an incident report, with one or multiple assists.
- Respond – to an incident assignment that has been dispatched.
- Go on or off Patrol

3.1. Start Using the LATATrax Driver Screen

Start using LATATrax from the "Home" screen of the iPad.

Action Steps III

What you do	What Happens
7. Touch the "Chrome" icon. See **Figure 4**	This opens the Chrome web browser and allows

Chrome Icon.	access to the LATATrax Truck Client website. ***Chrome is the only LATATrax certified browser***, other browsers may be used, but may have unpredictable results.

Figure 4 Chrome Icon

Action Steps IV

What you do	What Happens
8. Touch the address bar.	Activates the pop up keypad screen and allows the user to enter a web address.
9. Type the url information into the address bar of the browser, it will be assigned by your system administrator but will look similar to this: 38.124.164.211:9007/tabletclient/logon.html This must be entered exactly.	Enter the web url address for LATATrax as provided by the system administrator.
10. Touch the **"GO"** button in the virtual keyboard or touch the Logon button on the browser screen.	Connects to the LATATrax Driver Screen, sometimes called the map page.

Each driver has his own unique user name and password. When the driver logs in to the system everything he does is tracked to his user name. **DO NOT** share your user name and password with anyone else. Once these steps are completed a screen like the one shown in Figure 5 Logon Screen will be displayed.

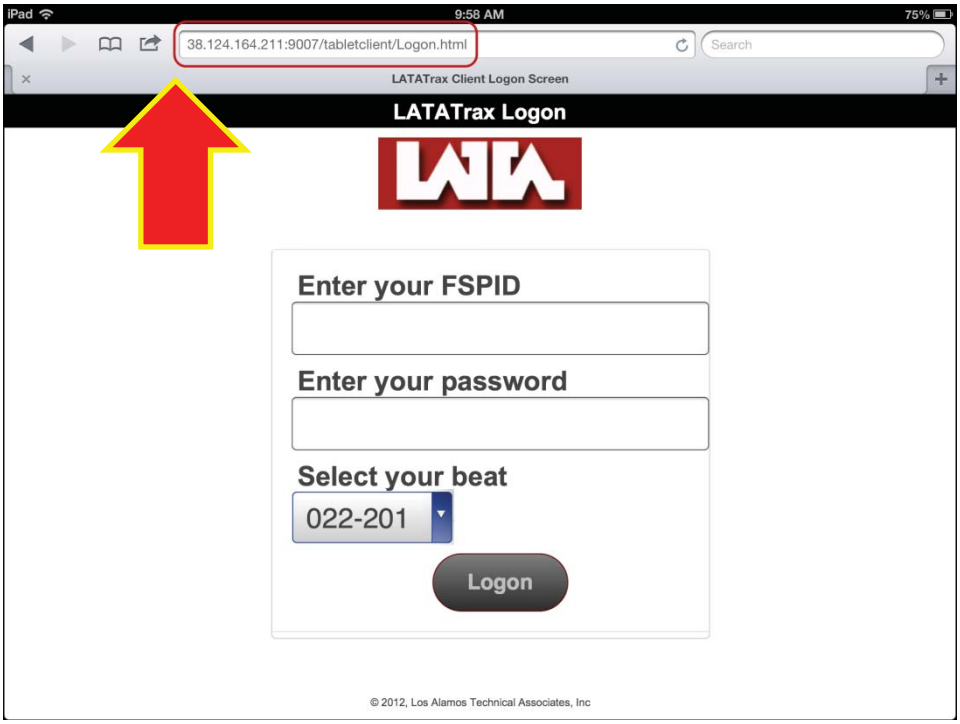


Figure 5 Logon Screen

NOTE:

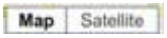
⚠	Your user name and password are unique. They identify you to the system. Everything done using your username is tracked back to you. **DO NOT** allow others to know your user name or password. **If you allow someone to logon using your username, you will be responsible for everything they do and this may involve disciplinary actions.**

Action Steps V

What you do	What Happens
11. Type your user id (FSPID) and password into the correct text boxes.	Your user id and masked password show in the appropriate boxes.
12. Select your initial beat from the Beat list.	This tells LATATrax which Beat you will be patrolling and identifies the boundaries for the beat you are signing in to patrol. It also will set the schedule to be adhered to and all associated alarms.
13. Touch the "Logon" button	This sends the logon information you have entered to the server for authentication. If an error occurs, a message will appear in red telling what the error is. Simply correct the problem and start again. If no error is generated you will see something like the screen shown in Figure 6, of course your name

	and beat will replace the one in this documentation.

4. LATATrax Driver Map

After a successful logon the screen shown in Figure 6, "LATATrax Status Screen," sometimes call the Map screen appears. The map below the option buttons is centered on the Vehicle icon in which you are operating, hence, showing the vehicle's location. As your Vehicle moves, the map moves to keep the Vehicle icon centered. The driver can change the map to terrain view by touching the "Map" button in the upper right corner of the map. The driver can also change to a satellite view by touching the "Satellite" button next to the Map button. 

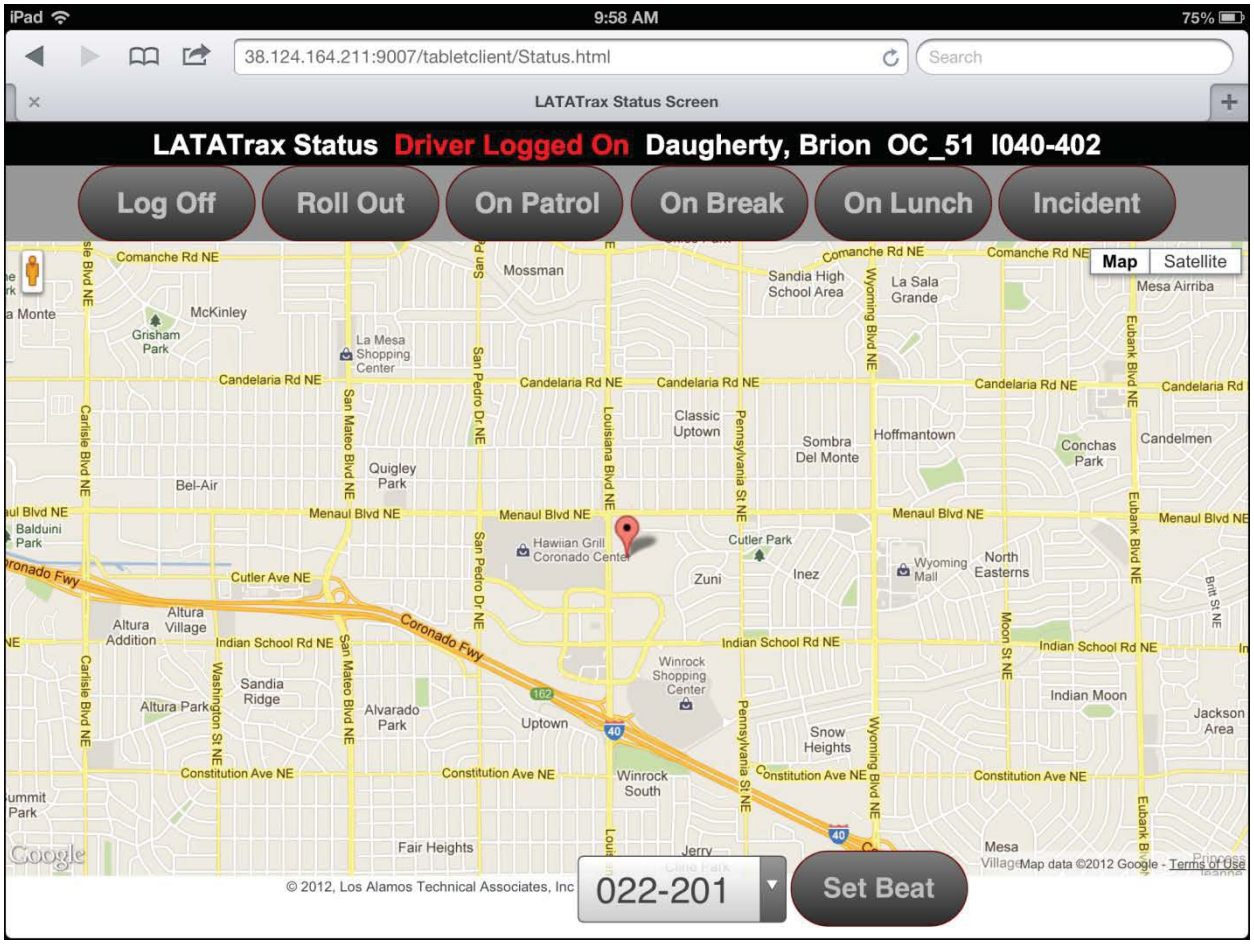


Figure 6 LATATrax Status Screen

4.1. Map Buttons

The LATATrax Status Screen or map features several Buttons that enable the driver to perform tasks with ease. The current Vehicle Status (in Red), driver name, Vehicle number and beat number are displayed on the black bar just above the Buttons. We will now review each button and its functiion.

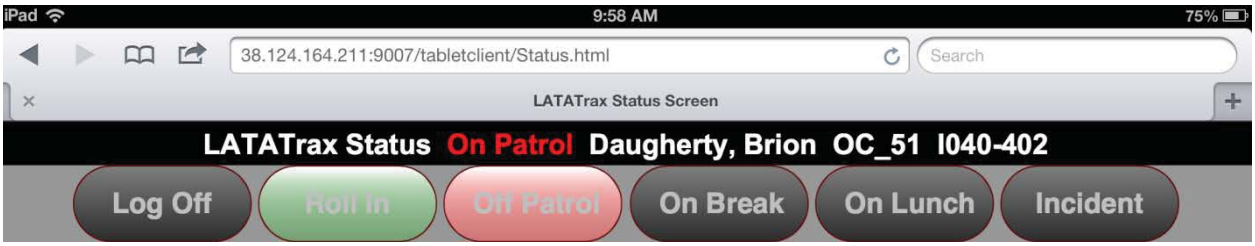


Figure 7 Tablet Button Bar

4.1.1. Log Off Button

The Log Off Button ***is only operable if the Roll In Button has been touched first*** and the LATATrax Status (in red on the black line above the buttons) is changed to state "Roll In." This is due to the constraints placed on schedule adherence. The Roll In and Log Off statuses are verified against the Beat's schedule for validation, i.e., a vehicle must complete Roll In prior to Log Off. If the Roll In status is changed prior to the Beat's scheduled Roll In time the driver will be prompted for an authorization code issued by an authorized authority. This code must be entered before Roll In is allowed. Then, the Log Off Button will be activated, which allows the driver to log off the system.

If the driver is changing to another (replacement) Vehicle, he must logoff the current Vehicle and then logon to the new Vehicle. (The previous driver must have logged off the replacement Vehicle before the new driver can logon.)

4.1.2. Roll In / Roll Out Button

The Roll In / Roll Out Button will toggle back and forth as the vehicle status changes. When first logging on the button will be in Roll Out condition. Once the vehicle status is On Patrol the Button will toggle to Roll In and become active. The driver is to touch the Roll Out button when leaving the yard heading to the beat logged on to. After the "Roll Out" button changes to "Roll In" this button will be used at the end of the beat prior to returning to the yard. The Roll In status prevents automatic dispatching to the vehicle from LATATrax as the shift is considered at a end.

The "Roll Out" button indicates that the vehicle is rolling to the assigned beat. However, the vehicle cannot be automatically dispatched as it is not yet in service. Touch the "Log Off" button once returned to the yard at the end of the shift.

4.1.3. On Patrol Button

Touch the "On Patrol" button to indicate that the vehicle has arrived at the assigned beat and has begun beat patrol. The LATATrax system will perform validity check against the beat schedule to insure and on

time patrol has begun at the scheduled time. The On Patrol button will be grayed to indicate its status is active. After this point, the patrol status will be controlled by other activities performed throughout the course of the beat schedule as seen in the following options.

4.1.4. On Break Button

Touch the "On Break" Button to indicate the start of a break. A large red box will appear in the center of the screen and the screen will gray in the background (See Figure 8 On Break Button). A count up timer is displayed to inform the driver how much time, in total, has been taken as break time during the scheduled beat. The vehicle status will change to On Break and automated dispatches to the vehicle will not be allowed.

Touch the "OK" button when the break is completed. The large red box is closed and the map and screen in the background returns to bright, as well as placing the vehicle status back to On Patrol.

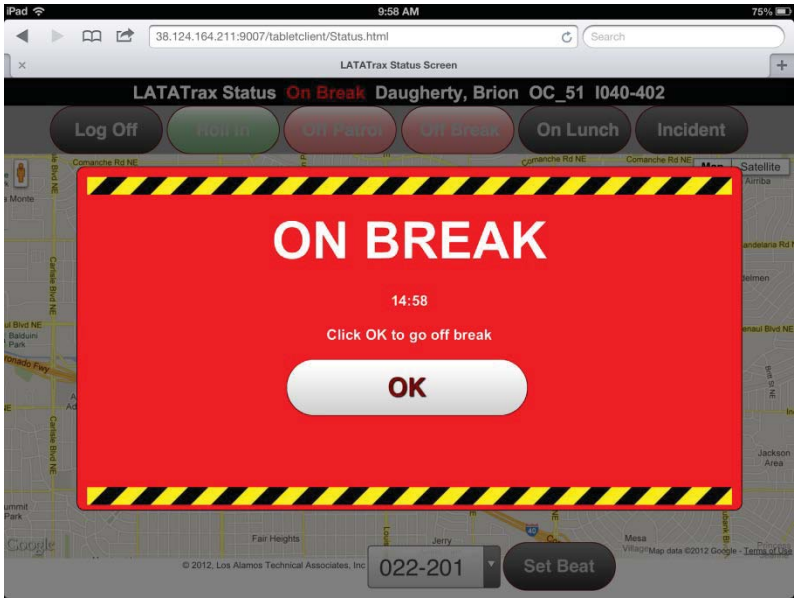


Figure 8 On Break Button

4.1.5. On Lunch Button

Touch the "On Lunch" Button to indicate the start of a lunch break. A large red box will appear in the center of the screen, the screen will gray in the background (See Figure 9 On Lunch). A count up timer is displayed to inform the driver how much time, in total, has been taken as Lunch time during the scheduled beat. The vehicle status will change to On Lunch and automatic dispatches to the vehicle will not be allowed.

Touch the "OK" button end the lunch break. The large red box is closed and the map returns in bright and the vehicle status returns to On Patrol.

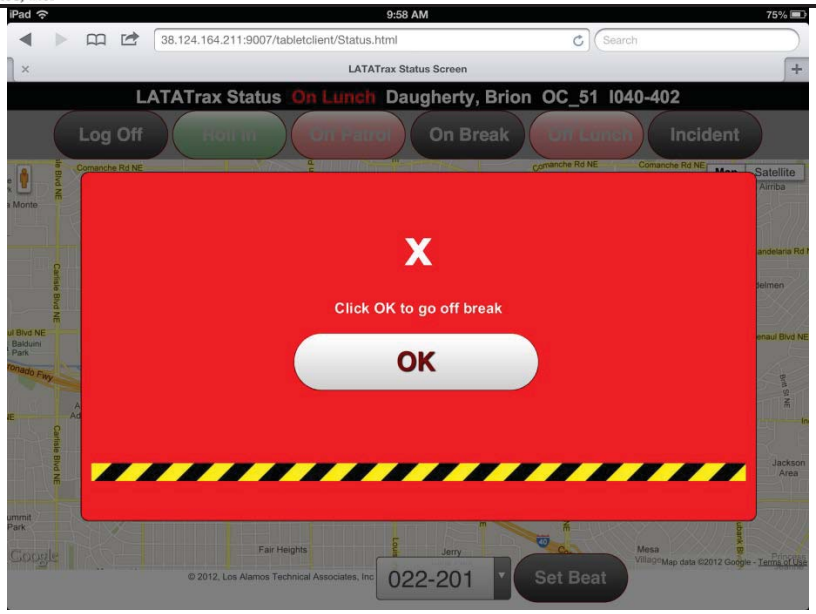


Figure 9 On Lunch Button

4.1.6. Incident Button

Touch the "Incident" button to open a new incident report form. An entry form, see Figure 10 Incident Form 1, will appear on the Driver's Screen and the vehicle status will change to On Incident, preventing automated dispatches by LATATrax.

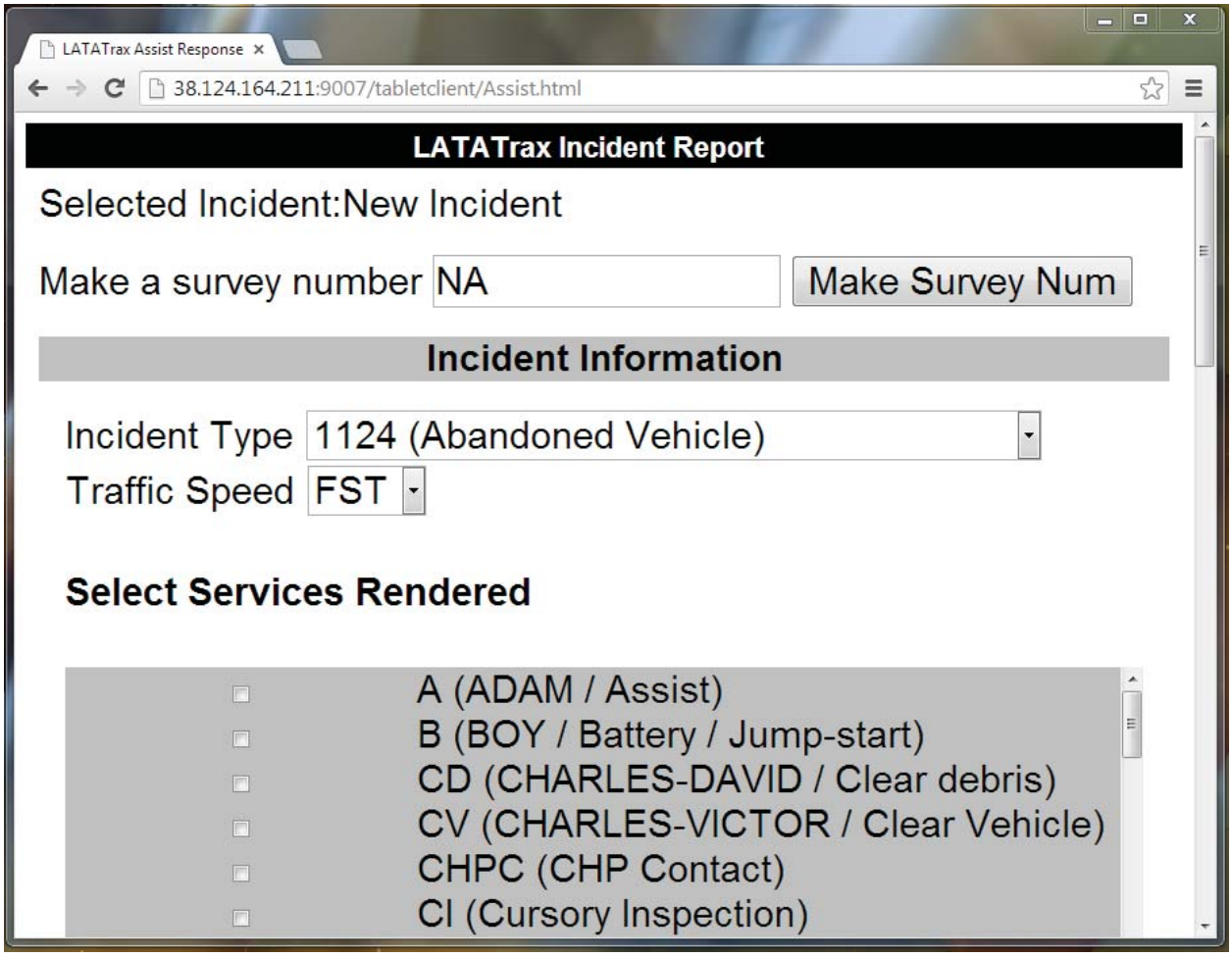


Figure 10 Incident Form 1

The first item to describe is the "Make a survey number" box. The button to the right of this box is used to self generate a Survey Number. This number is used by the motorist or customer served to access a web site to provide feedback to the Authority concerning their assist experience. This number is to be transferred to the brochure that is given to the motorist or customer by the driver upon initial contact. To generate the Survey Number touch the "Make Survey Number" button, a number will appear in the text box to the left of the button. There are times when no Survey Number is required, such as an abandoned vehicle left on the side of the roadway; in which case, simply do nothing with the field and proceed to the rest of the form under the gray bar with "Incident Information" centered in it.

The remainder of the form has numerous entry options and requires the driver to scroll down through the form to see and enter all assist information in to it. There are three different types of entry fields in the assist form:

- Drop-down List – A text box with a down arrow at the right end indicates a drop-down list. Touch the down arrow and then Touch the correct list item. The selected item will display in the text box.

- Text Box – A box that accepts input from the keypad. Some Text boxes are restricted to numbers only. (For example: Odometer readings.) Some accept numbers, symbols and letters. (For example: Drop Zone information.) These boxes will vary in size, however they all have this same appearance. Additionally, some of the Text boxes will have default information in them. These are the most commonly used descriptions or other common data entries.

- Multi-Select Menu – A list of items with a small square box next to each item. Touch the box to select the associated item. More than one item may be selected at a time. For example, the Services Rendered list shown below in Figure 11 Multi-Select Menu, could have none, one, or multiple items selected; all could be selected if required.

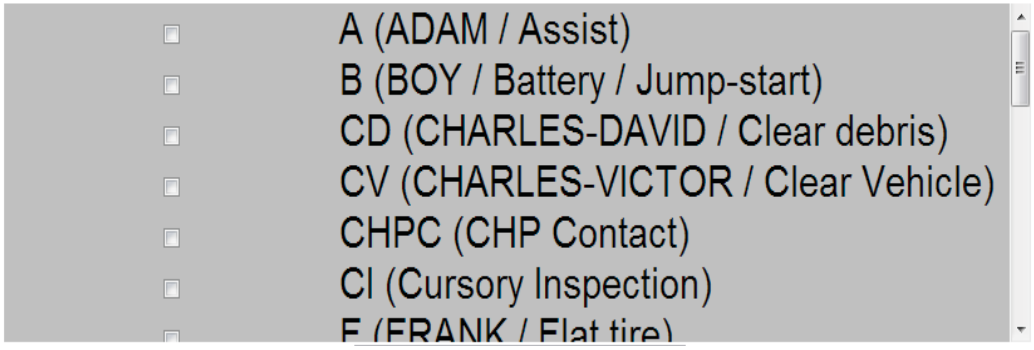

A (ADAM / Assist)
B (BOY / Battery / Jump-start)
CD (CHARLES-DAVID / Clear debris)
CV (CHARLES-VICTOR / Clear Vehicle)
CHPC (CHP Contact)
CI (Cursory Inspection)

Figure 11 Multi-Select Menu

These Text boxes and data entry items are selected and configured by the implementation team during the LATATrax installation process. They will vary by user site an group.

4.1.7. Complete an Assist

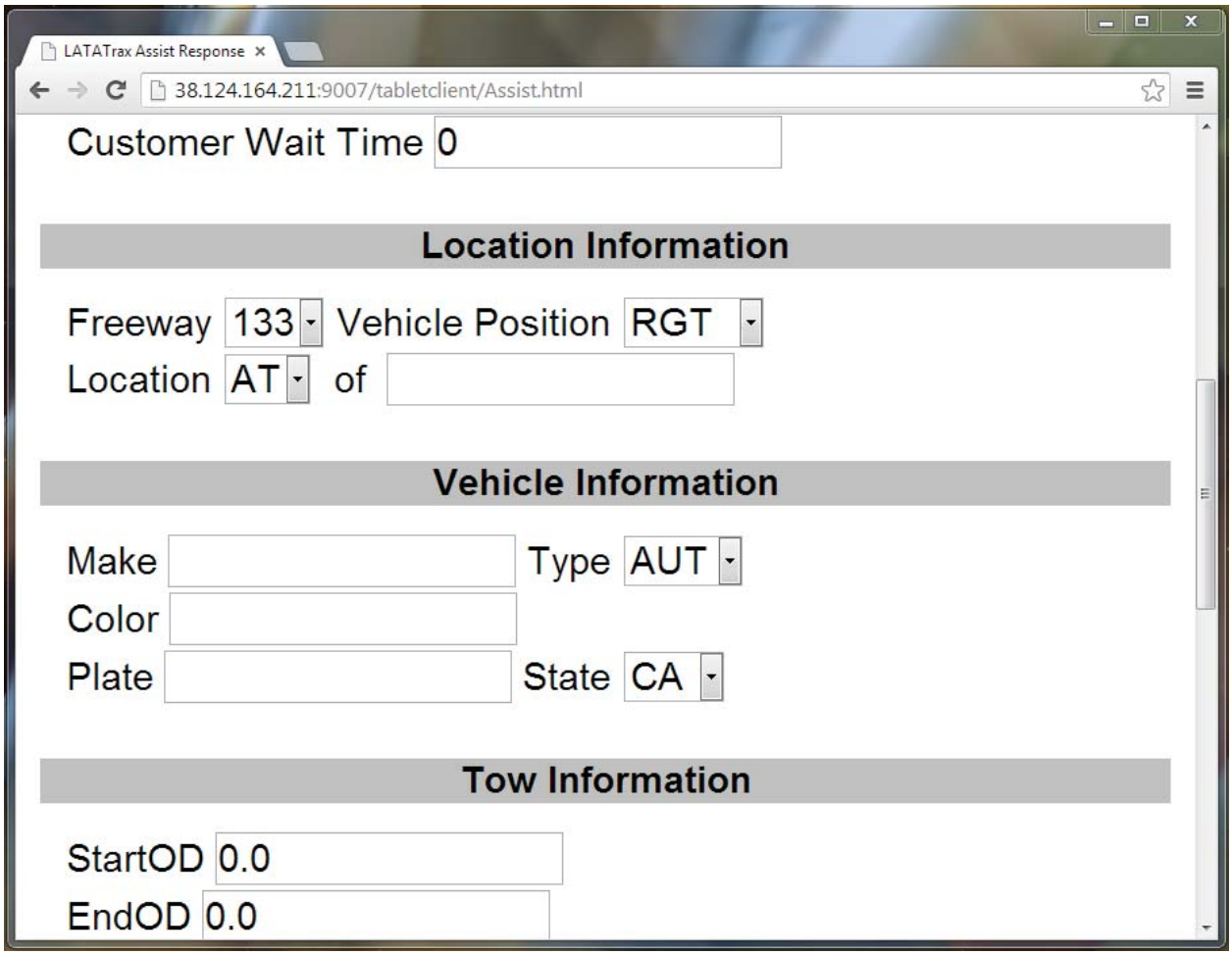


Figure 12

Customer Wait Time: The entry items in the next part of the Assist form consist of the items seen in Figure 12. Customer Wait Time is a numeric field as represent the elapse number of minutes the customer waited for the assist vehicle to arrive to their location.

Location Information: The entry items under the Location Information bar describe the actual freeway identification number, position on the roadway, the nearest cross street reference, i.e. AT, JSO (just south of), etc., and the name of the nearest cross street intercepting the freeway mentioned.

Vehicle Information: The entries made under the Vehicle Information bar are used to fully describe the motorist's vehicle involved in the assist. They include Make, meaning the vehicle manufacturer, color of the vehicle, license plate number, the state issuing the plate, and the type of vehicle, i.e. AUT for auto, VAN for mini-van, etc.

Tow Information: These field under the Tow Information bar are a method of tracking the miles used in a towing requirement. "StartOD" represents the towing vehicle's starting odometer reading as "EndOD" represents the towing vehicle's ending odometer reading. Continuing with the next assist entry page allows an entry for the actual location the motorist's vehicle was towed to, such as a designated drop zone defined by the local cities; in which case an actual Drop Zone name is entered. Additionally, there are motorist's vehicles that are simply towed from lanes of traffic to the shoulder awaiting the arrival of a private towing company such as AAA.

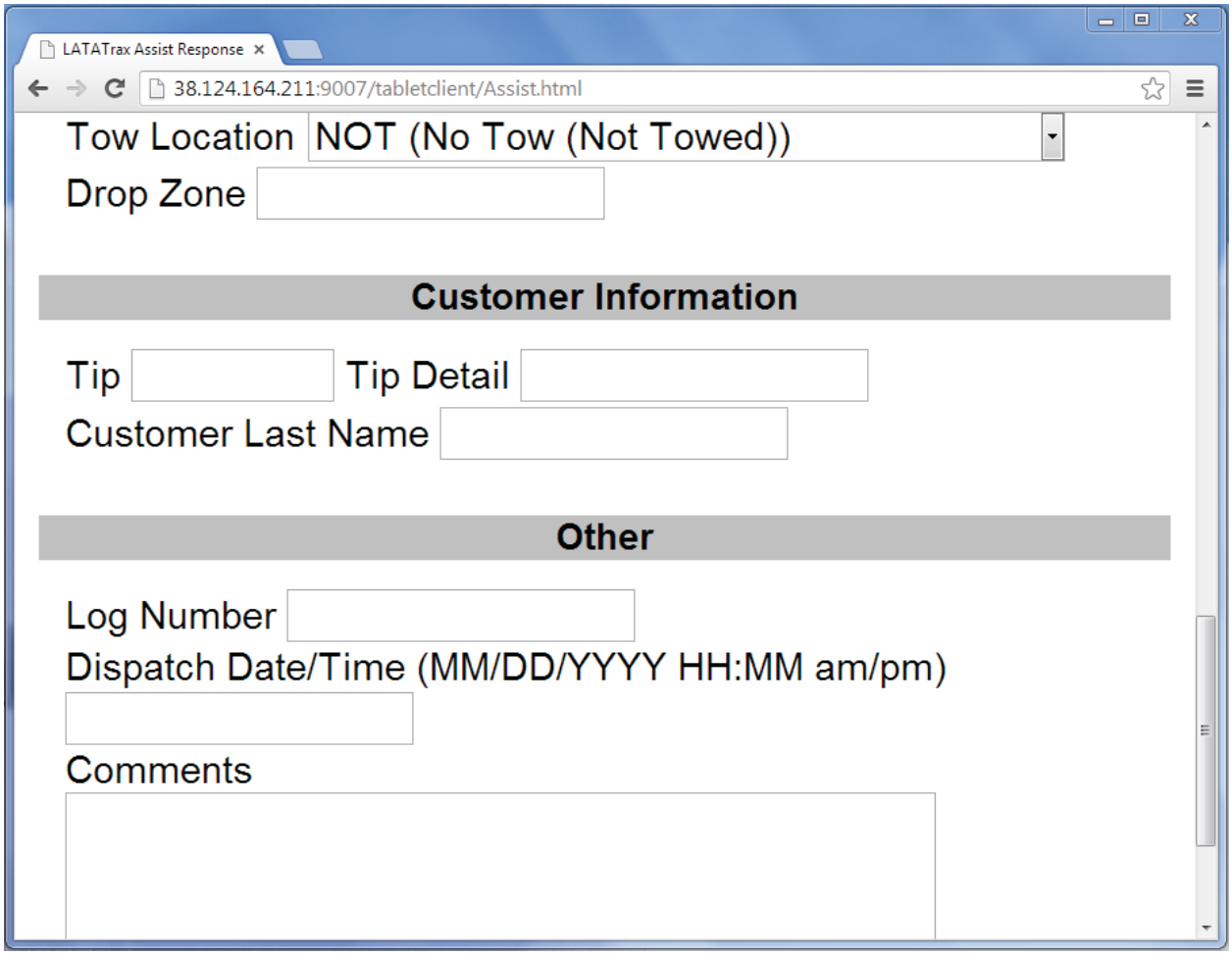


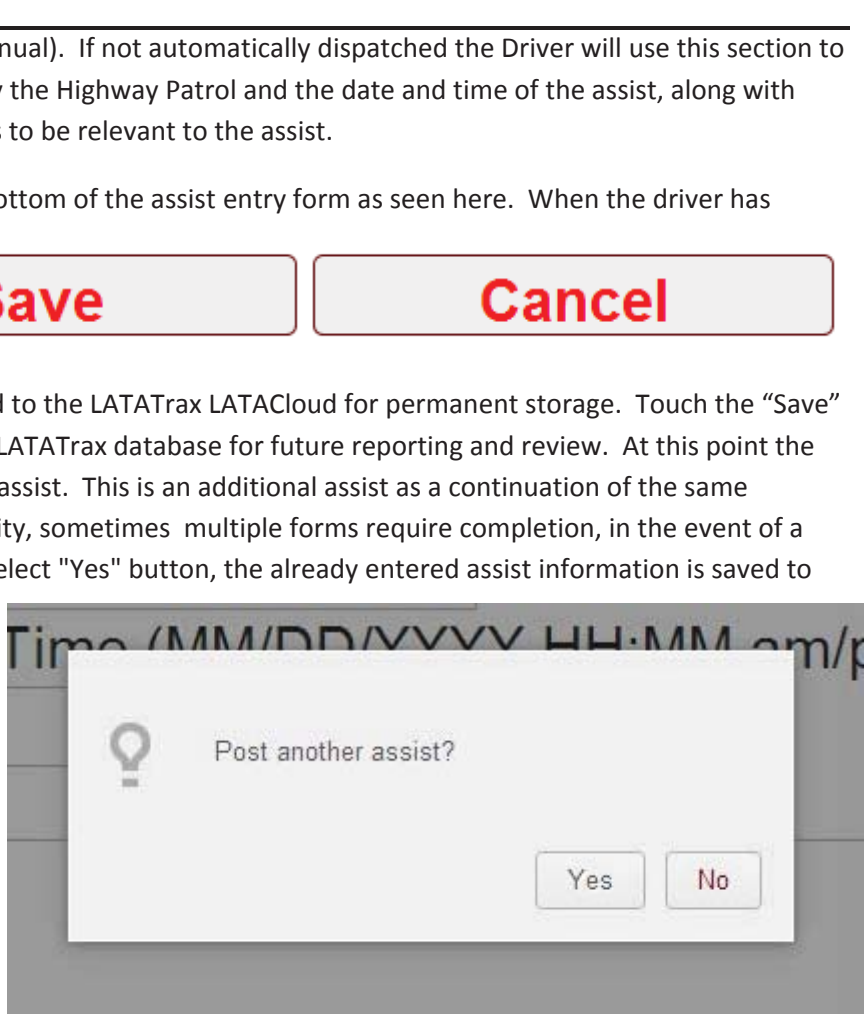
Figure 13

Customer Information: The data fields under the gray bar called Customer Information are used to collect information about how the customer express appreciation to the vehicle driver that provided the service. On some occasions an assisted motorist insists on providing a tip or other gratuity, in which case a value and description of the gratuity along with the motorist's last name is collect to express the authorities acknowledgement to motorist.

Other: The gray bar entitled Other is sometime prefilled if the Incident was automatically dispatched by the LATATrax system (this is described in the "*Dispatching and Service Tracking*" module

of the LATATrax system user's manual). If not automatically dispatched the Driver will use this section to enter any log number provided by the Highway Patrol and the date and time of the assist, along with any comment the Drivers believes to be relevant to the assist.

Two buttons will be seen at the bottom of the assist entry form as seen here. When the driver has completed entering of all fields on the assist form, the report can be submitted to the LATATrax LATACloud for permanent storage. Touch the "Save" button to submit the form to the LATATrax database for future reporting and review. At this point the Driver is asked if there is another assist. This is an additional assist as a continuation of the same incident, however, do to complexity, sometimes multiple forms require completion, in the event of a multi-car accident. If the Driver select "Yes" button, the already entered assist information is saved to the LATATrax database, the form is cleared, and the entry process begins again at the top of the assist form. Once all assists are entered and the Driver selects "No" to this prompt the last entered dated is saved and returns the vehicle status to On Patrol.



In contrast, if for any reason the Incident form was entered into in error simply touch the "Cancel" button and the form will be cancelled, the vehicle status will return to On Patrol, and automatic dispatches will be allowed.

Note:

If the On Incident Button was accidentally touched, the driver can scroll to the bottom of the assist form and touch the "Cancel" button to return to the map screen. No data is sent to the LATATrax database if this action is chosen.

5. Understanding Alerts and Dispatches

The LATATrax system has additional elements that are sent directly to the onboard tablet from other areas of the system such as, Highway Patrol Officers, 911 Dispatch Operators, or other Authority Personnel depending upon the configuration of the LATATrax system at the time of implementation by the customer.

5.1. Alert Messaging

5.1.1 Amber Alert

This message type, Alert Messaging, was developed to support the National Amber Alert notification system. If an Amber Alert is executed within the region of the vehicle's operational beat a special notice can be entered by any authorized agency and sent simultaneously to one, several, or all vehicles operating under the LATATrax system control. When such a message is sent, regardless of the vehicle status, a message box like the one in figure 14 is displayed for the driver's awareness.

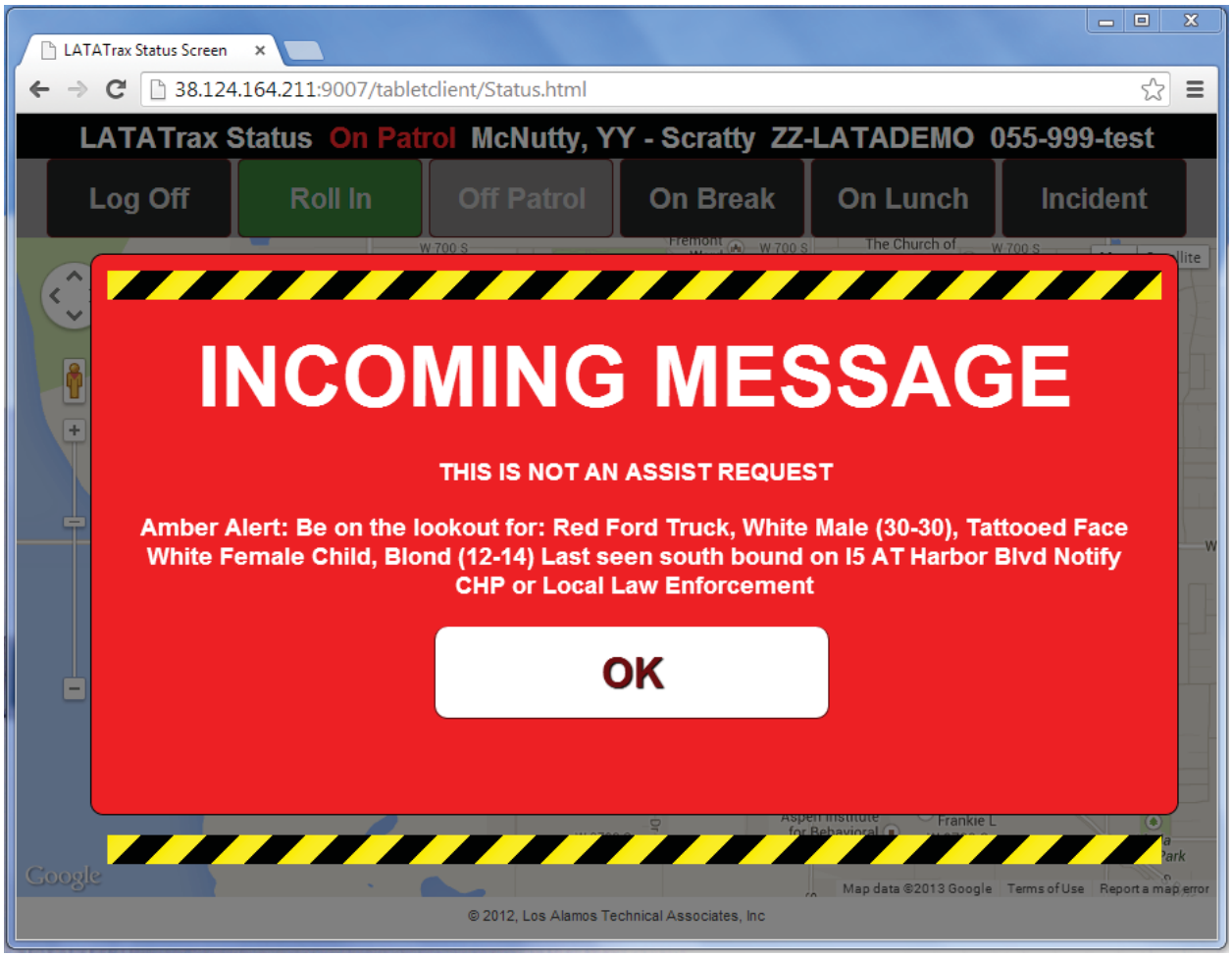
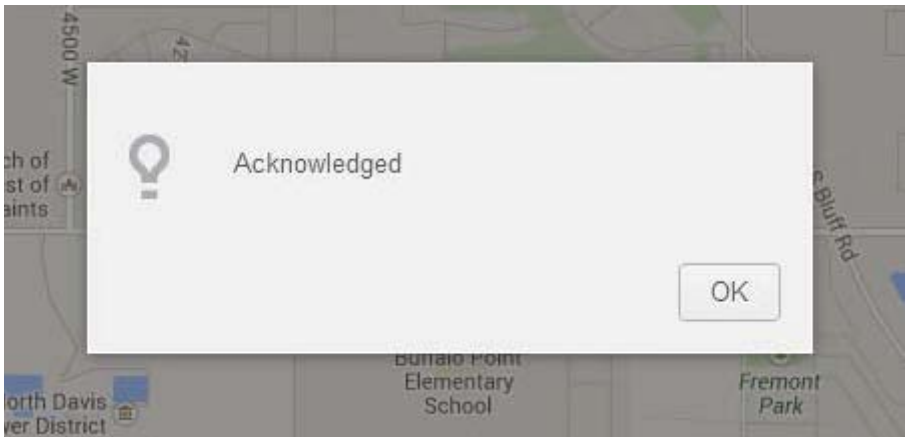

LATATrax Status Screen
38.124.164.211:9007/tabletclient/Status.html
LATATrax Status On Patrol McNutty, YY - Scratty ZZ-LATADEMO 055-999-test
Log Off
Roll In
Off Patrol
On Break
On Lunch
Incident
INCOMING MESSAGE
THIS IS NOT AN ASSIST REQUEST
Amber Alert: Be on the lookout for: Red Ford Truck, White Male (30-30), Tattooed Face White Female Child, Blond (12-14) Last seen south bound on I5 AT Harbor Blvd Notify CHP or Local Law Enforcement
OK
Google
Map data ©2013 Google
Terms of Use
Report a map error
© 2012, Los Alamos Technical Associates, Inc

Figure 14 Amber Alert

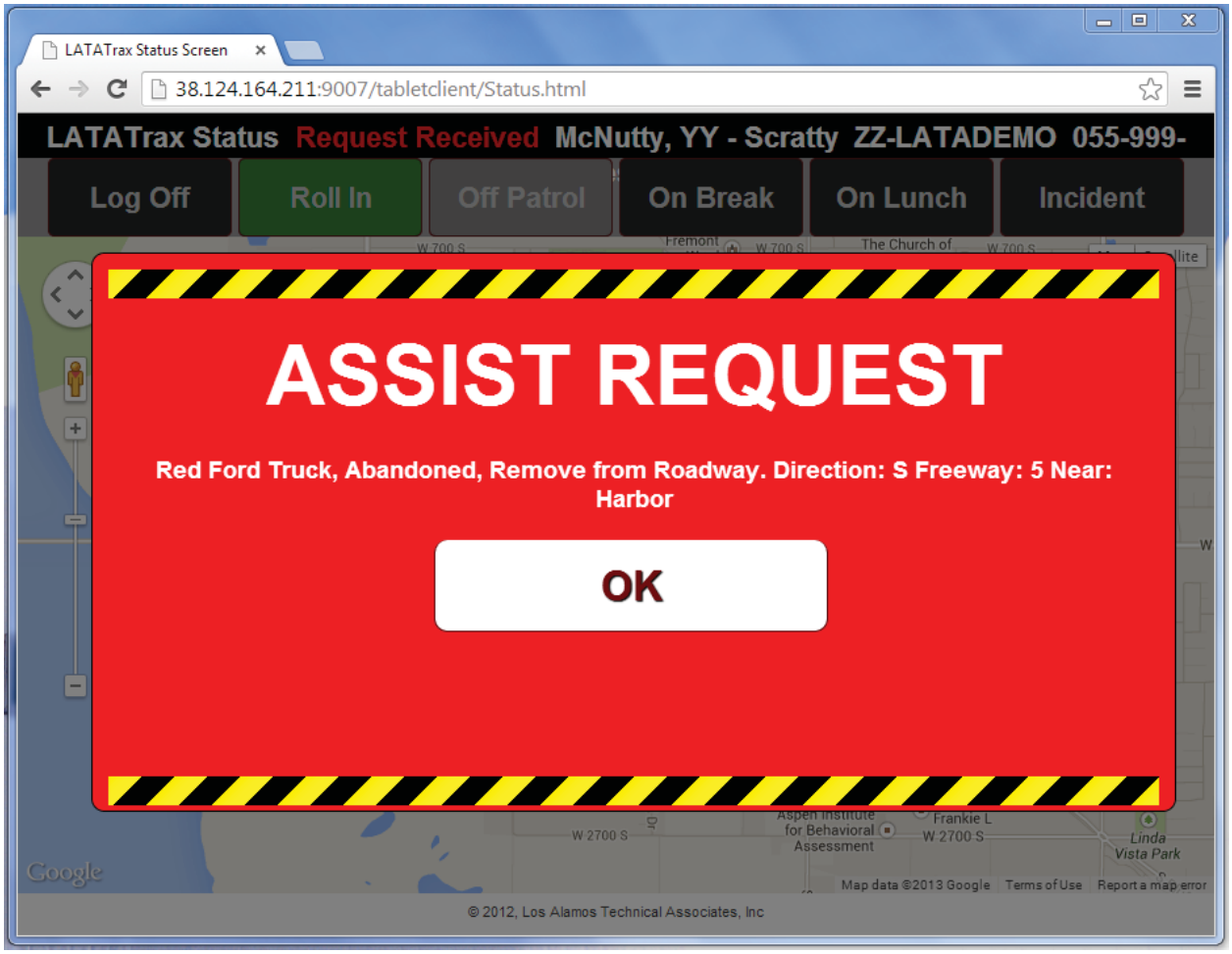
This message screen requires a response to close it out and to stop an audio alarm, it is done by touching the "OK" button centered on the screen. Additionally, another confirmation box is displayed to the Driver's screen, again the driver must acknowledged this message to confirm the message has been read and the Driver is formally acknowledging the message.



The measure of a double acknowledgement is a back up to insure the Driver is aware of the difference between a normal dispatch and an Amber alert.

5.2 Dispatched Incident

There are several sources o f incidents that can be automatically dispatched to vehicles on patrol in the several active beats during any given shift. Those dispatches are sent to the Driver's tablet in a manner that cannot be mistaken. However, unlike the amber alert, these messages will not interrupt an ongoing assist entry. In this case the message will be held until the vehicle status returns to On Patrol. The message appears as Figure 15.



When the driver received this message it is acknowledged by touching the "OK" button. The Driver's screen returns to the Map, however the vehicle status changes to "En Route" telling the dispatching authority that the Driver has received the dispatch and in on the way to the incident direction provided.

Once arrived on the incident location the driver touches the "On Incident " button and proceeds to perform the assist as described in **4.1.6** of this Guide.

Appendix A - How to change the iPad's automatic text functions.

The iPad's automatic capitalization, automatic correction, automatic spell checking, and "enable caps lock" functions can be very helpful when using the iPad to write e-mails, term papers etc.

These features can be a hindrance when trying to type in your user name and password. The iPad will try to correct what is being typed. It will try to "fix" your user name and password entries causing them to be incorrect and to fail authentication.

If you wish to disable these "Auto" functions, follow the directions below;

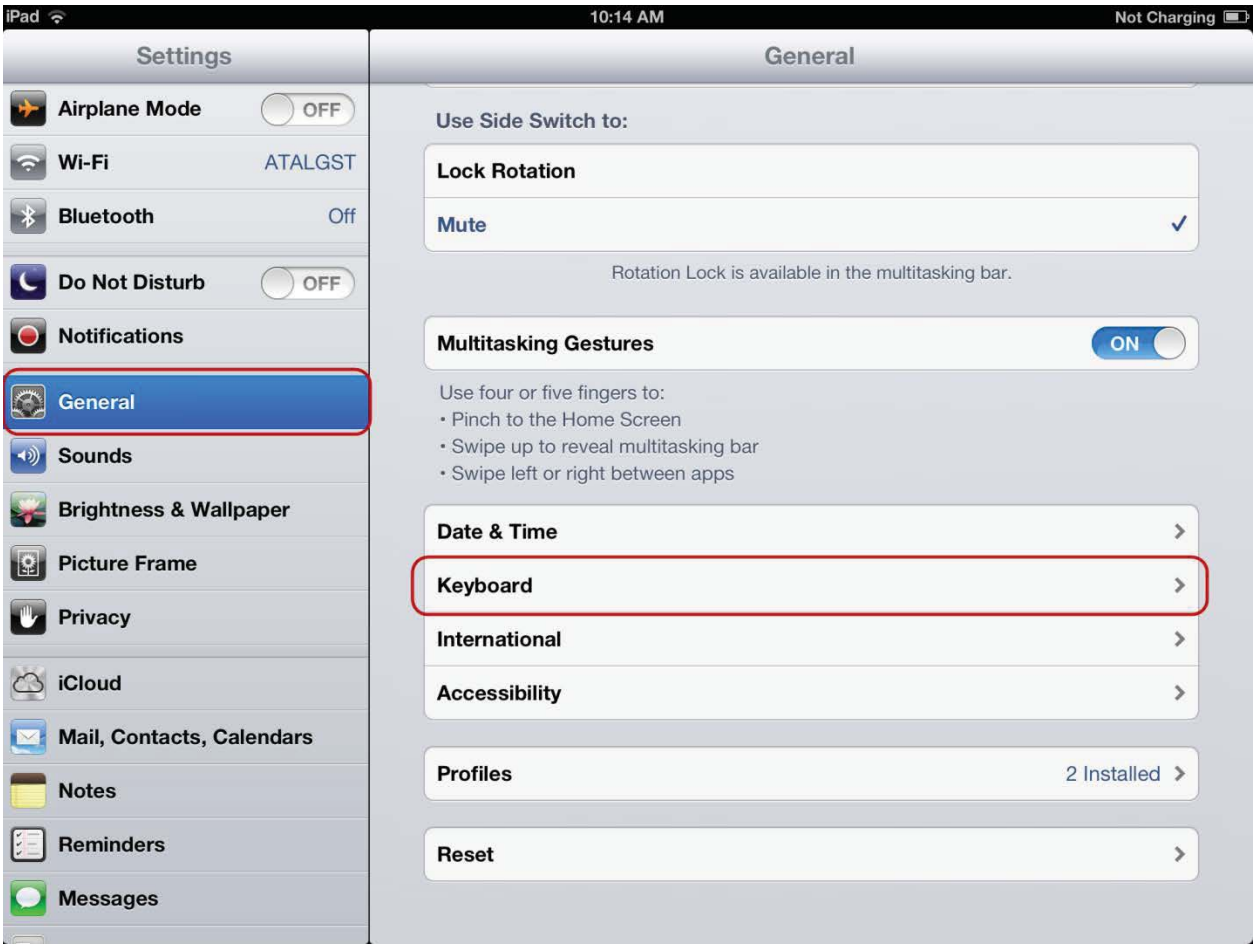


Figure 10 Settings Screen

Action Steps

What you do	What Happens
1. Start from the "Home" screen. Touch the "Settings" icon. See **Figure 1 The Settings Icon.**	Opens the settings screen.
2. Touch the "General" button on the left side of the screen under "Settings". See **Figure 14 Settings Screen.**	Displays the "General" settings on the right portion os the screen.
3. Touch the "Keyboard" button in the "General" settings on the right portion of the screen.	Displays the iPad keyboard options.

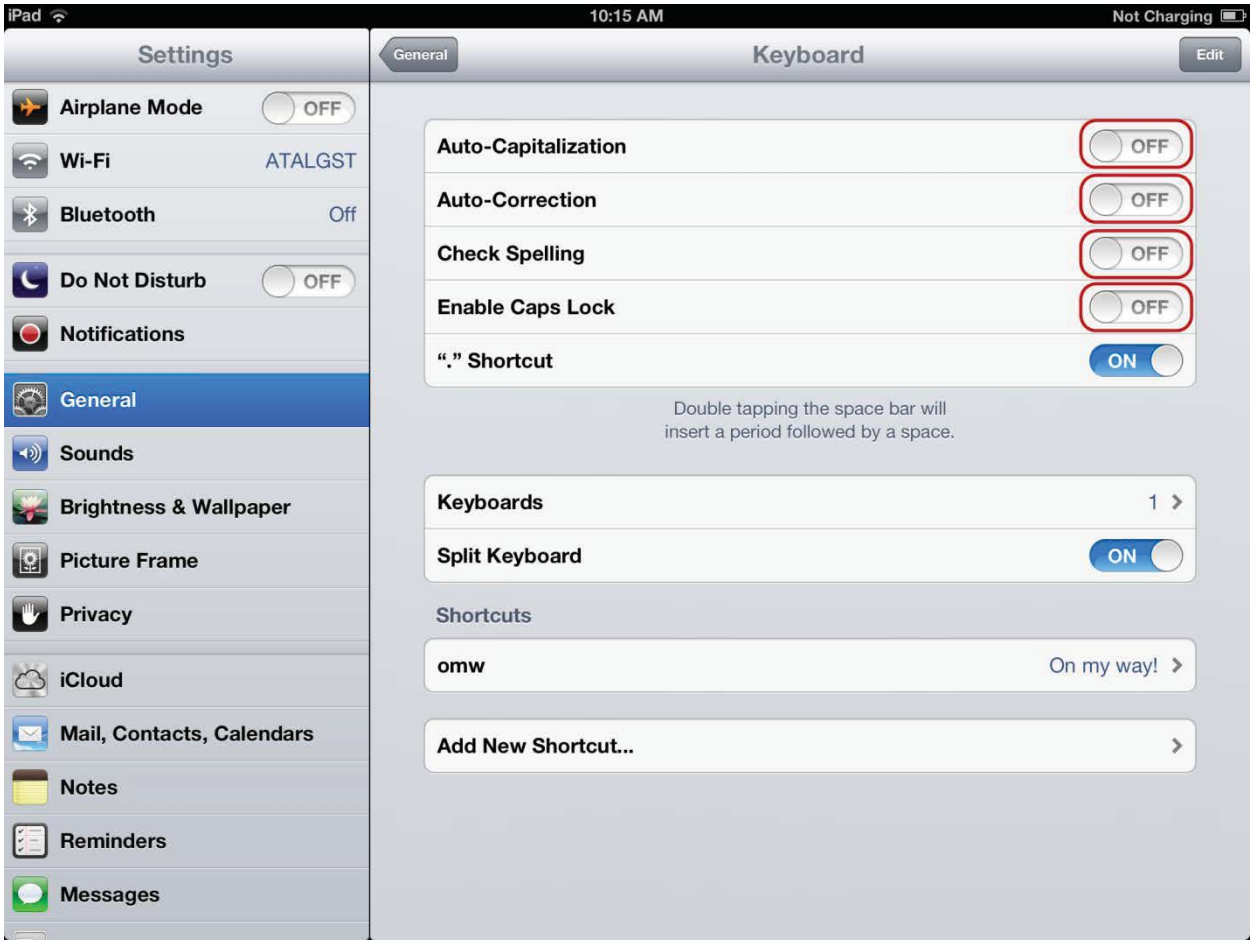


Figure 11 Keyboard Options Settings

Action Steps

What you do	What Happens
4. Touch the **"ON"** button next to **"Auto-Capitalization"**. See **Figure 15 Keyboard Options Settings.**	Turns the Auto-Capitalization feature **OFF**.
5. Repeat **Step 4** above for **"Auto-Correction", "Check Spelling" and "Enable Caps Lock."**	Turns these features **OFF**.
6. Touch the "Home" button.	Returns to the home screen.

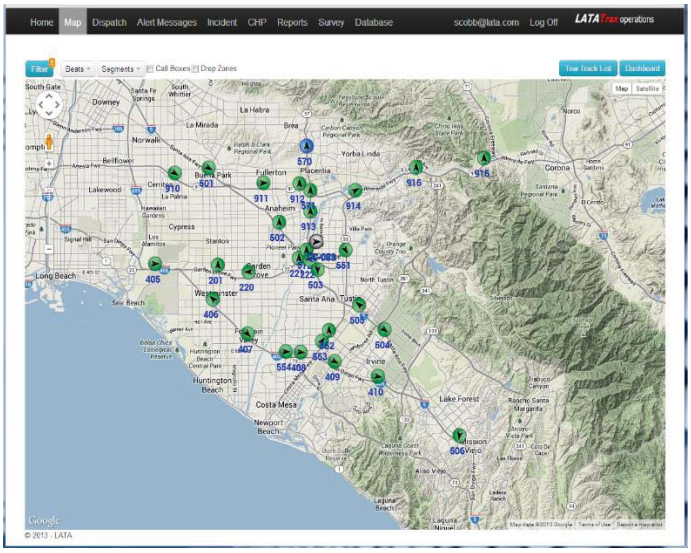
To turn these features back on, repeat steps one through six.

LATATrax Base System – User's Manual

Mapping:

The Mapping module is, in short, a map of the actual geographical area in which the vehicle fleet operates and can be global or a county, state, county, city, or campus area. Every vehicle with the on-board module installed and running will appear on the map as an individual icon centered over the latitude and longitude intersection transmitted by the on-board GPS equipment. All tracked vehicles will appear simultaneously and move over the map area. The unique feature of the LATATrax mapping module is the vehicle icons move over the map, not the map moving under the icons. This feature allows an unlimited number of vehicle observations and tracking universally. Accuracy is within three meters.

Several mapping types are available and special maps may also be displayed. For example a pictorial satellite image, a terrestrial relief, a common street, or any defined specialty map can be employed with the vehicle icons rendered over the selected map. LATATrax is provider agnostic allowing the use of ArcGIS, Google, Bing or any other user selected map provider map to be employed.



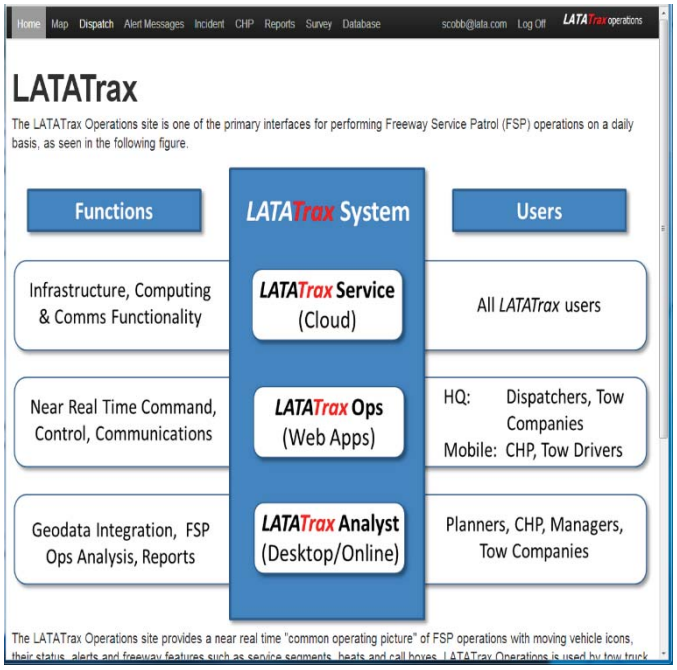
A significant amount of GPS and GIS information is transmitted every ten seconds to the central hosting system by each vehicle and can be accessed via the map. The customer may double click on any icon and gather user defined information such as vehicle id, driver name, speed, and vehicle status. Additionally, a follow button appears in this information box, if clicked the map zooms in on that particular vehicle icon and shows its precise location every ten seconds. If the satellite view is employed with labels the fleet manager can detect if the vehicle is parked at a fast food outlet, a mall, of other location of interest; or observe turn by turn actions of the vehicle operator in real time.

The map feature also includes buttons that drive a "Vehicle Grid" and "Dashboard" that displays a table of information about every vehicle on the map for quick comparison and deeper drilling into the map

screen. For a deep dive into the vehicles on the map the button called “Dashboard” can be click to view the finest detail of all vehicle movements and status, including historical speeding events, cardinal headings, or many other elements that are user defined in real time.

A Tour of Mapping

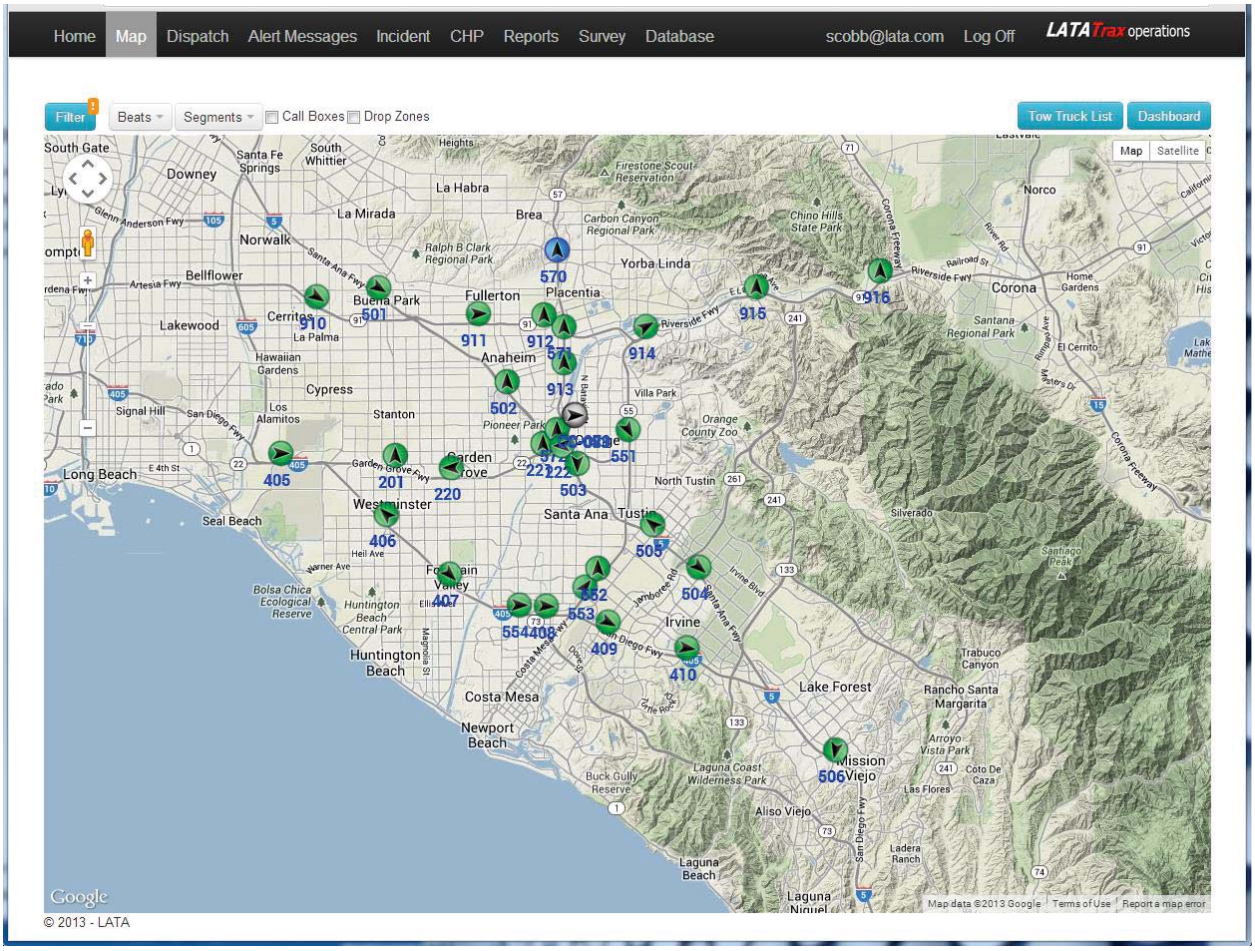
So then, let’s take a tour of this mapping thing. Of course one must begin by logging on to the LATATrax system (covered in “***System User Roles***”). Once logged on you will find your viewing the Home page of the LATATrax User’s Site. As you look at the black bar at the top of this page you will notice that there are a number of grayed words. Such as Map, Dispatch, Alert Messages, and so forth. The topic of this conversation will be surrounding the many uses and functions of the Map. This is the heart and lungs of the LATATrax system and will be of more use to the management of fleet traffic and understanding of flow than any of the other system elements combined.



Without further discussion of the subject let’s get to the map and begin to explore the capability of the LATATrax Map. Just hover your mouse icon over the grayed word “Map.” The word will highlight, this is the system method of notifying you that you are within the screen action area for going to the Map. Just click on “Map” or if you are using a tablet simply touch the word. The system will bring up the Map.

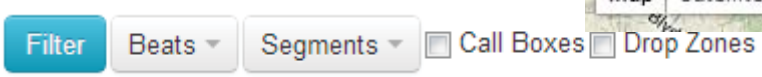
Before we move to the visuals of the map it is important to know that this map is highly interactive. There are several control features, map choices, and buttons that will take you to other pages from the map, while leaving the main map underlying all this action. Go ahead click the Map word.

Understanding what you are looking at:



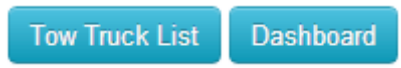
First, let's point out that this documentation will be showing a county in Southern California called Orange. However, it must be remembered that any geographical area can be displayed on the map by the selection of the implementation team (a mix of people from both LATATrax and the customer site). Even the centering location of the map is a configuration choice; your geographical choice can be global, a country, an ocean, a state, a county, a city or simply a campus. The centering of this map was chosen to be the intersection of Interstate 5 and State Road 22, in a city called Tustin. The map was customized carefully to show Orange County, California. Your map will be tailored to your implementation team's choices.

Once the map is displayed on your screen we would like to draw your attention to some features imbedded in the functionality of the Map page. Let's look first at the Map page displayed on your

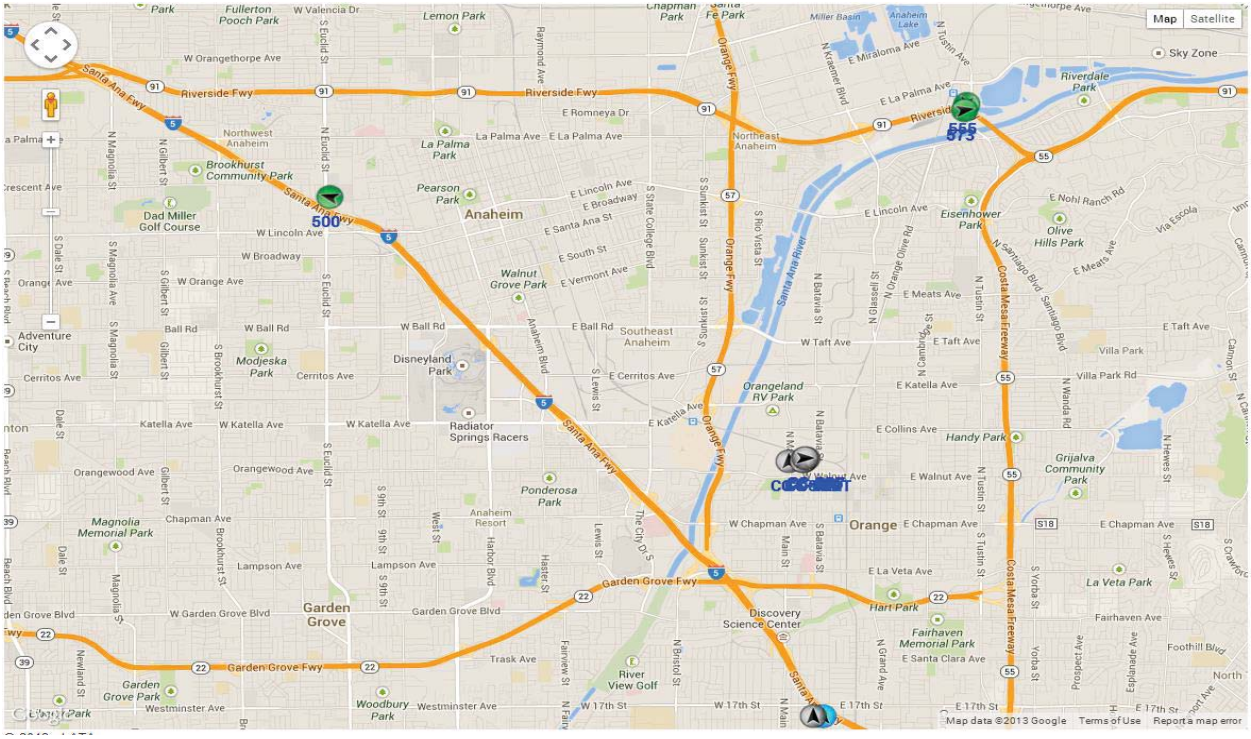


monitor, scan it until you can easily location the various Map Controls. Some are in the white space in corners and some seem to be camouflaged in the Map itself.

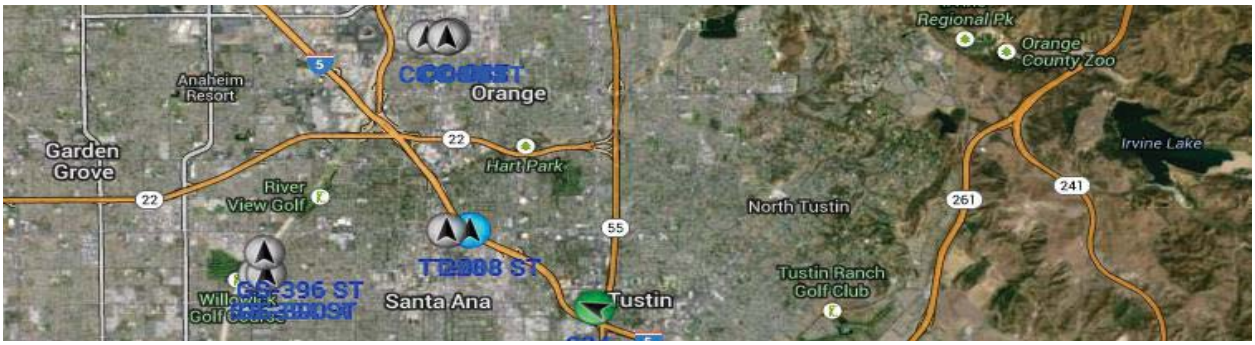
These controls allow each user of the Map page to express the page as they would like to view it. There are two other map control features that may go unnoticed if not pointed out: These are referred to as Fine Controls and are cleverly hidden in the upper right hand corner of the map itself. We'll cover these first as you will want to use them as we progress through this tour.



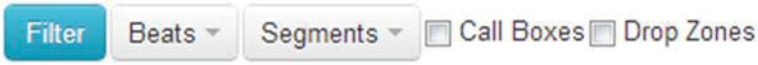
If you hover your mouse icon over the Map area of the Fine Controls area you will see that a small menu drops down from the button with one selection, "Terrain" if the box is checked you see the relief map you are now looking at, this is the default page map. By unchecking that box you will see a standard road map:



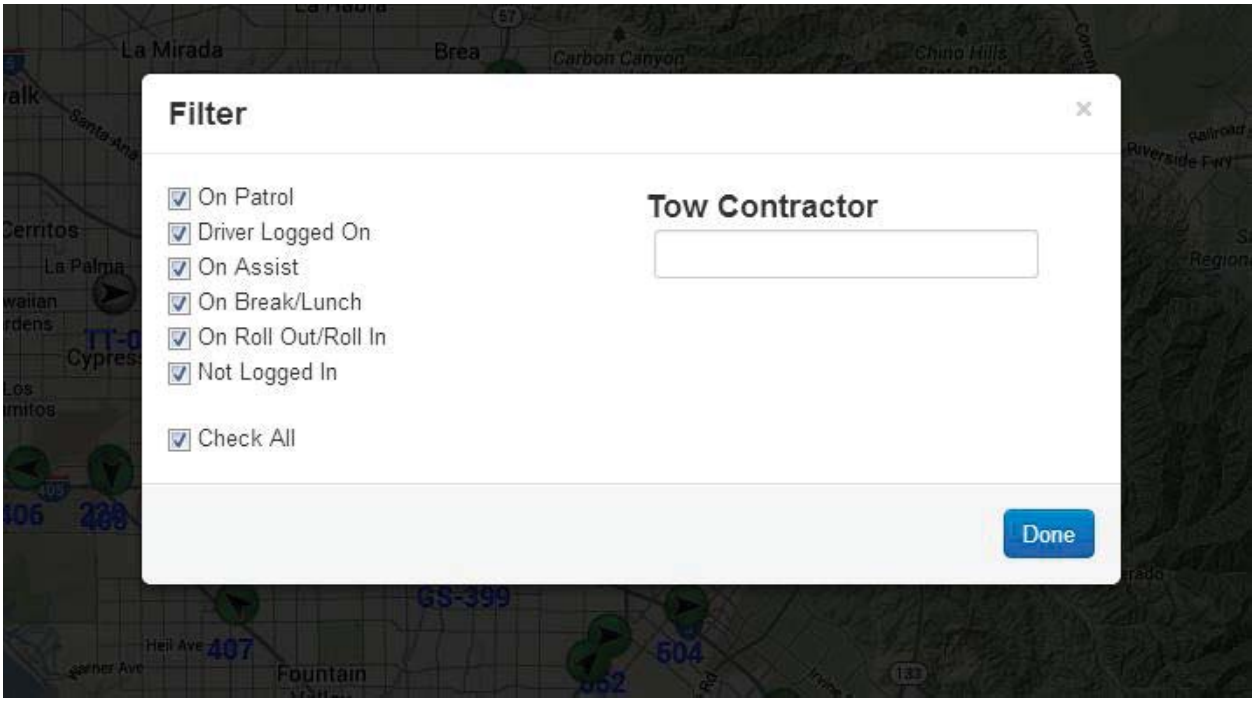
If you do this with the "Satellite" button you will see the map from a bird's eye view called satellite imagery:



Let's now go back to the other Map Controls and look at the "Filter" button:



Because LATATrax allows the configuration of individual states or statuses for each vehicle icon on the map, some or all of the vehicles can be filtered out, by clicking or touching the Filter boxes:



As you do so, the map is blackened and the filter screen is displayed over the top of the map. You can see all options are check by default. This means that every operating vehicle will be displayed on the map. This sometimes has a cluttering effect, in which case you may select only the status or state of vehicle you would like to see on the map. In this case, the map configuration is for Freeway Service Patrol vehicles. The system was configured with six status types. Additionally, the beats for this service is contracted out to many contractors. The "Filter" button can also limit the vehicle icons to those that belong to a specific contractor by entering that contractor in to the box under "Tow Contractor."

When finished customizing the map filter for the view you are interested in, simply click or touch the "Done" button. The icons remaining on the map will only be those you have decided to view on the

map. There are no restrictions to the use of this feature any combination of selection can be included or excluded. The remaining icons will specifically be related to your view.

If you wish to return to the original default map with all icons showing simply refresh the screen by pressing the "F5" button on your keyboard, clicking on, or touching the refresh symbol on the page:

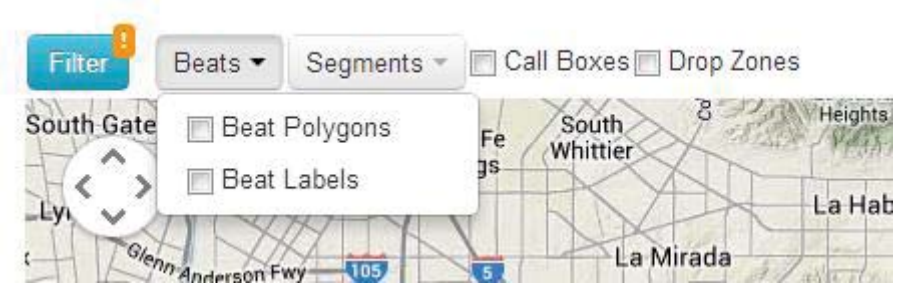
Knowing beats or routes:

Many fleets have a set of standard beats or routes that must be adhered to during shift operations. Although these beats and routes are constructed and explained in the section of this user's manual called "***FusionWhere***" they are used throughout the LATATrax system as a method of monitoring and managing the fleet drivers to ensure the fleet requirements are met in terms of staying within the bounds of allowed activity and on schedule as provided by the fleet.

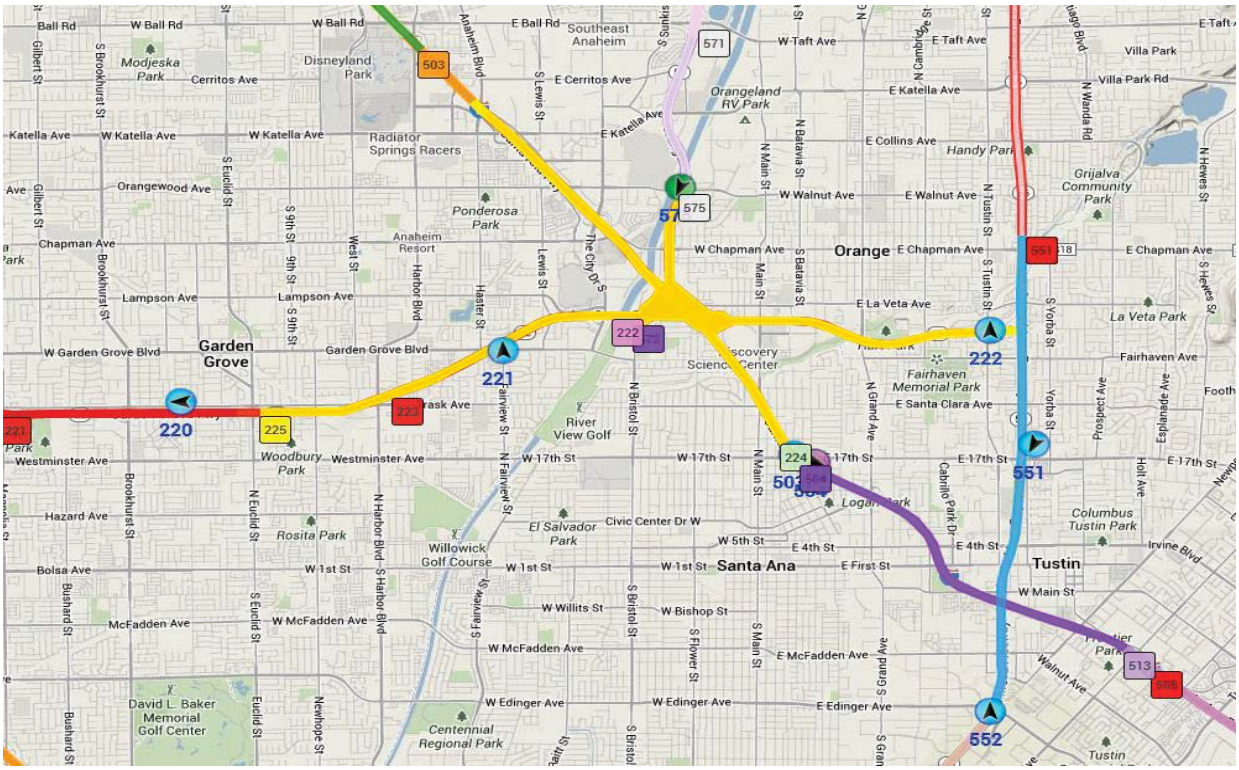
A short brief on beats and route is a must at for this stage of touring the Map. Beats are composed of smaller sections called segments. Both are actually polygons drawn using the FusionWhere add-in of Esri products. These polygons are used for marking out boundaries for fleet vehicles to operate within.

As a viewer of the Map, administrator of the system, or a fleet manager it may, from time to time, be required to check to see if a vehicle is operating within the bounds of the beat or route assigned. Sometimes they may want to know a description of the vehicle's general location. Succinctly put, segments are drawn, named, and stored in a database as individual geographically bounded areas. This is done by using latitude and longitude points that when combined make a polygon structure covering a mapped area called a "geo-fence." These geo-fences or segments are then assembled in a connective order to form a beat or route.

These beats or routes and their Segments can be viewed in an inactive way. By using the map with icons representing vehicles the viewer can locate, while vehicle icons are moving around the map, their current location. The icons are updated by the "On Vehicle Equipment" every 10 seconds and move around the Map as each update occurs. To view the actual beets hover over either the Beats or Segments button, a menu will drop down with prompting boxes for what information is wanted to be seen on the map. By selection either a Polygon or Label or both boxes those artifacts will be over layered on the map showing a very precise view of the Beats.



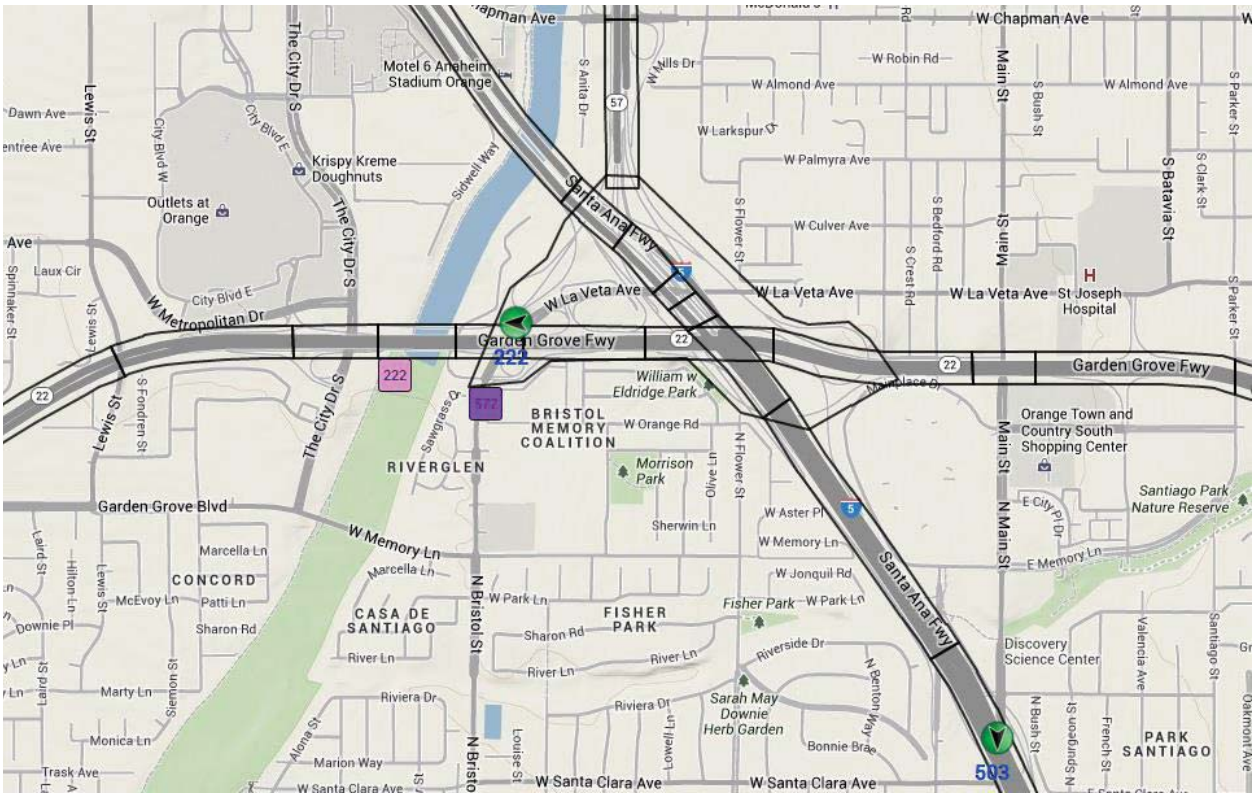
Both the "Beats" button and the "Segments" button have drop down selections. First let's look at the results of a beat selection of both Polygons and Labels. This view is a zoomed in for better clarity of the results of this feature. As you can see from the displayed map below each beat or route is color coded. The color used is selected during the beat creation process covered in the "FusionWhere" section of this User's Manual.



The color coding of each beat helps to distinguish it from adjoining beats, the square boxes show which beats join each other in the same color as their beats. With this in mind we'll now look at the Segments which make up these beats by turning on the segment artifact features. Once this is done the map will also show the division of each beat by the segments that make it up.

Segment polygons can be constructed in many different ways. As the example shown the polygons are lengths of various US Interstate Freeways and California State Road Freeways. The Transportation Authority required to have a beat construction rule that would enclose 98% of all the freeway systems that are covered by their Freeway Service Patrol with minimal manual polygon construction. To satisfy this requirement, LATA employed FusionWhere to construct the polygons with a 50 meter width from the centerline in both directions. This provided a 100 meter wide corridor for each freeway.

Some special segments were created manually to include significantly large interchanges like the one shown here. This segment was added to several beats keeping vehicle within the beat boundaries.



As you can see each segment for the beats are shown with the live vehicle icons moving through the map. This feature allows you to directly and clearly view if a vehicle is within the assigned beat or not.

This is not the best and easiest way to discover if vehicles are within bounds. The Map has some drill down features and additional functionality that makes this discovery process simpler and much more direct.

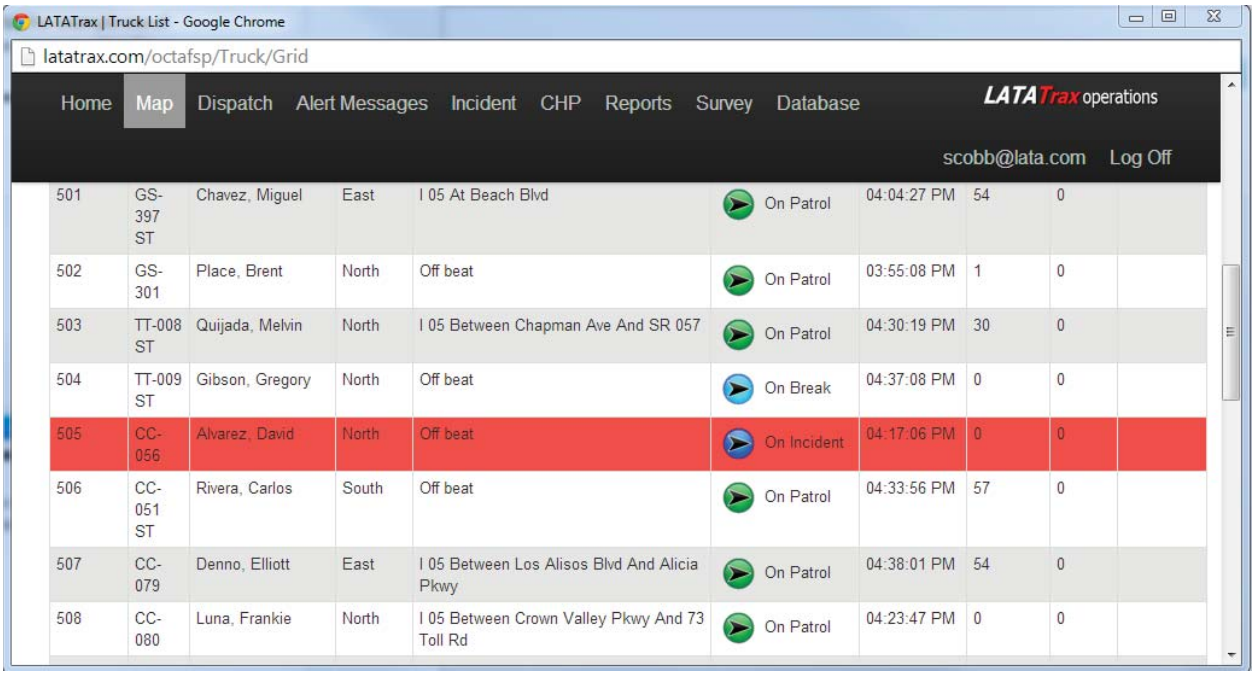
We will now explore the “Tow Truck List” button. Though in this example we are looking at Tow Trucks would could as easily be looking at busses, para-transit vehicles, passenger train cars, taxies, ships, or any other terrestrial vehicle. By clicking on or touching the “Tow Truck List” button a second web page will pop up on your system monitor.

As shown below, this page has a great deal of information about all vehicles being tracked simultaneously on the map. This new page, the “Truck List,” has a special featured button as well, called

“Column Configuration” that allows specific choices of a number of columns that can be included or excluded on this page’s list. If clicked or touched it displays a filter option for the page.

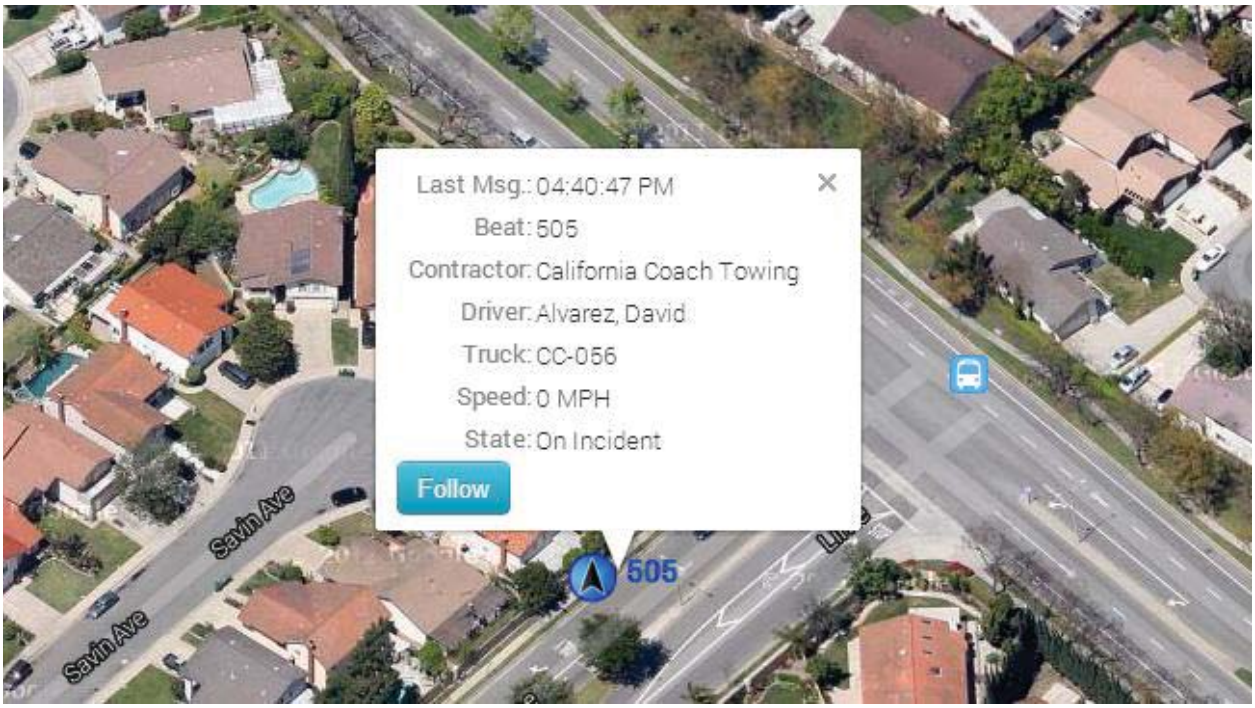
Once configured as desired the purposes of this screen are many and very useful. For example one of the columns is “Location” which if within a beat will provide a description of the segment within the beat the vehicle is in, if not, “Off Beat” is displayed.

This allows for drill down tracking of the vehicle that is off beat by selecting the vehicle's line, by clicking or touching the line. When this is done the line is highlighted in red and the vehicle icon is zoomed in on and followed back on the map page. To view the map move the mouse to the map page and click, or touch the page.



501	GS-397 ST	Chavez, Miguel	East	I 05 At Beach Blvd	On Patrol	04:04:27 PM	54	0
502	GS-301	Place, Brent	North	Off beat	On Patrol	03:55:08 PM	1	0
503	TT-008 ST	Quijada, Melvin	North	I 05 Between Chapman Ave And SR 057	On Patrol	04:30:19 PM	30	0
504	TT-009 ST	Gibson, Gregory	North	Off beat	On Break	04:37:08 PM	0	0
505	CC-056	Alvarez, David	North	Off beat	On Incident	04:17:06 PM	0	0
506	CC-051 ST	Rivera, Carlos	South	Off beat	On Patrol	04:33:56 PM	57	0
507	CC-079	Denno, Elliott	East	I 05 Between Los Alisos Blvd And Alicia Pkwy	On Patrol	04:38:01 PM	54	0
508	CC-080	Luna, Frankie	North	I 05 Between Crown Valley Pkwy And 73 Toll Rd	On Patrol	04:23:47 PM	0	0

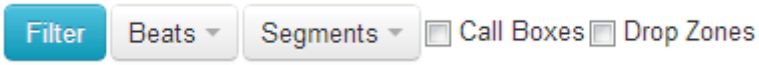
In some cases it becomes quite clear that the vehicle is not on beat or engaged some activity that is not the status the driver has declared to be accurate. In the case shown the vehicle's status indicated it is on an incident and assigned to a beat, "505," when in fact the driver has his vehicle in a neighborhood, not on a freeway.



However we would like to point out the information that is included as part of the Map's Truck List detail. As can be seen, there is the time, the beat assigned, the company owning the vehicle, the driver's name, speed, and the state the driver selected as part of his ongoing duties.

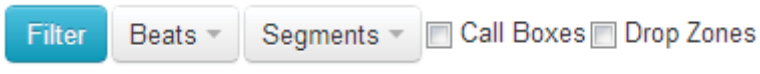
Once in the follow mode another button option appears on the Map, it is the "Stop Following" button, it can be selected by clicking on or touching, upon which the follow ceases and the page returns to the base Map display. This action also closes the Truck List and clears the underlying page, refreshes the Map, and set all defaults to their original state.

Artifact Overlay Controls:

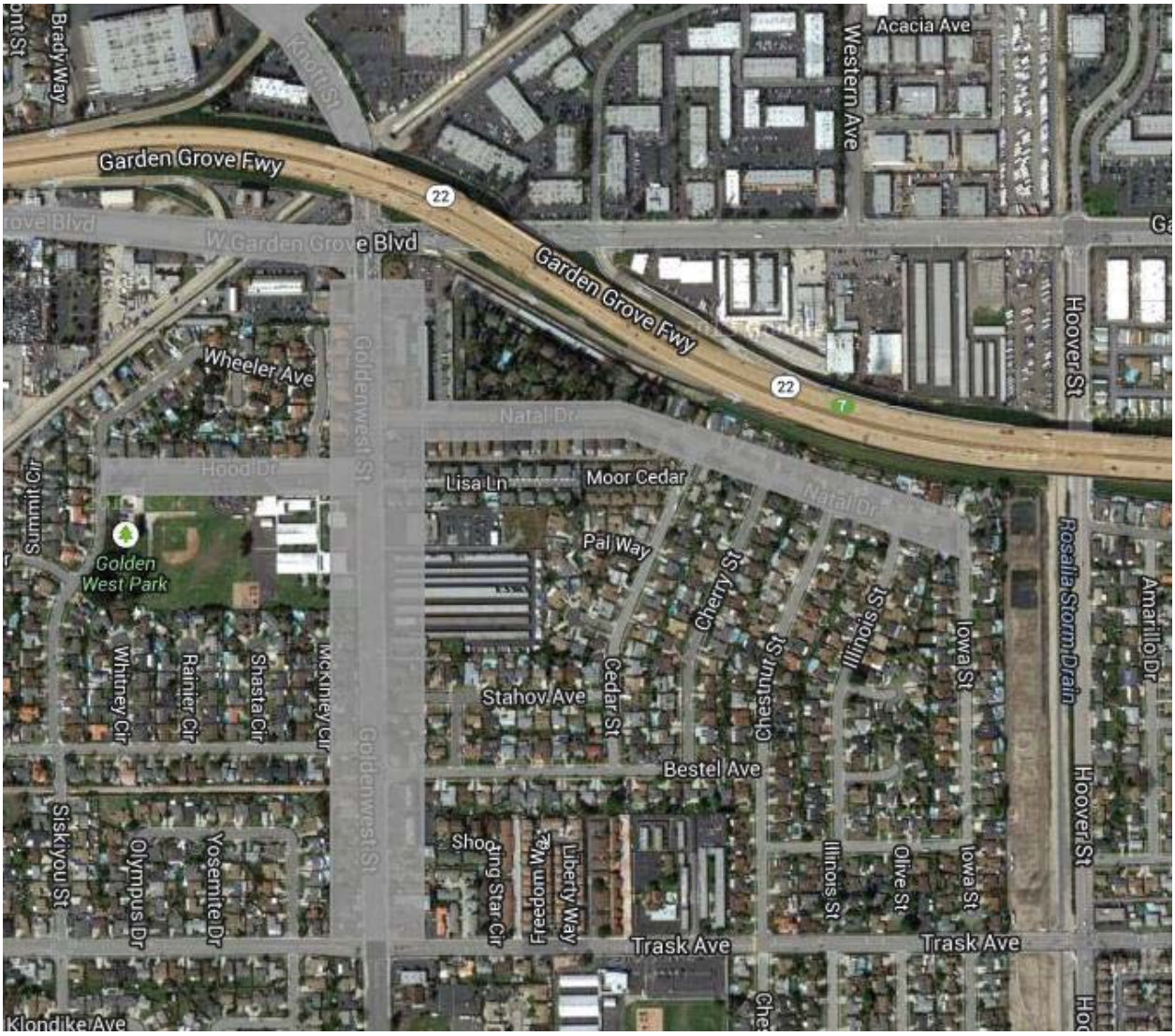


Some additional features on the Map Controls allow the displaying of configurable artifacts. In this case the customer configured the location of highway emergency call boxes for motorist who become stranded or have other emergencies. The object of the call box overlay is to know the location of a call box such that the motorist simply provides the call box's number and the location is known or the 911 operator can view the location.

This feature can also be zoomed in on for an actual view of the call box and its surroundings. This picture shown in not in real time, however, the satellite image is exactly the area and shows the call box itself, just to the left of the call box icon shown here:



Another overlay of a mapping artifact, in this case, is the "Drop Zones." These are areas that have been geo-fenced specifically for drivers of Tow Truck vehicles to locate areas that motorist's vehicles may be towed to and dropped for the motorist's convenience and be managed at a future point in time. It works in similar fashion to the "Call Box" feature. By clicking on or touching the "Drop Zones" button, streets approved by the local Cities will be grayed over showing the driver where an approved drop zone is, close to their vehicle's current location.

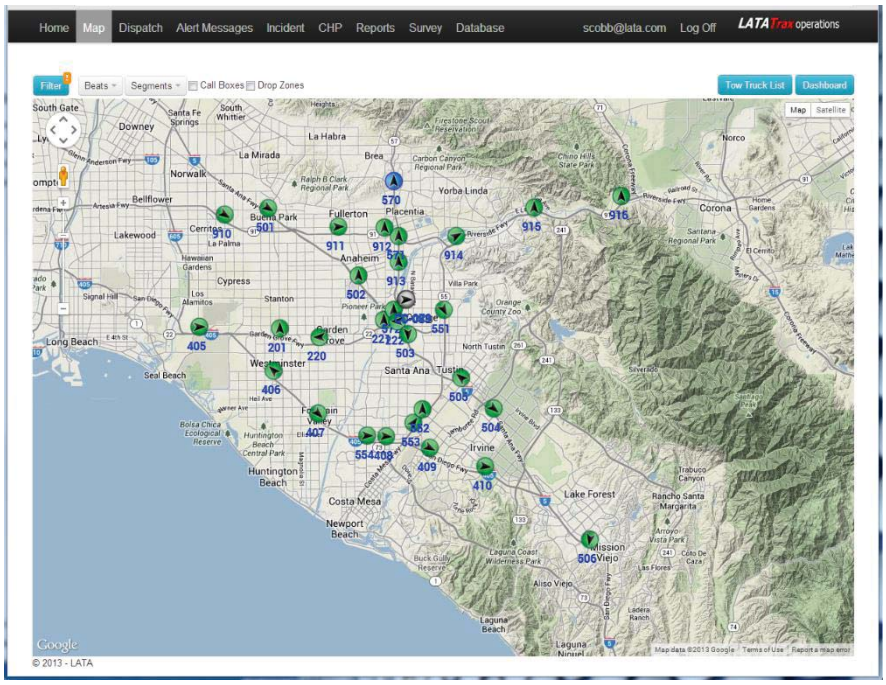


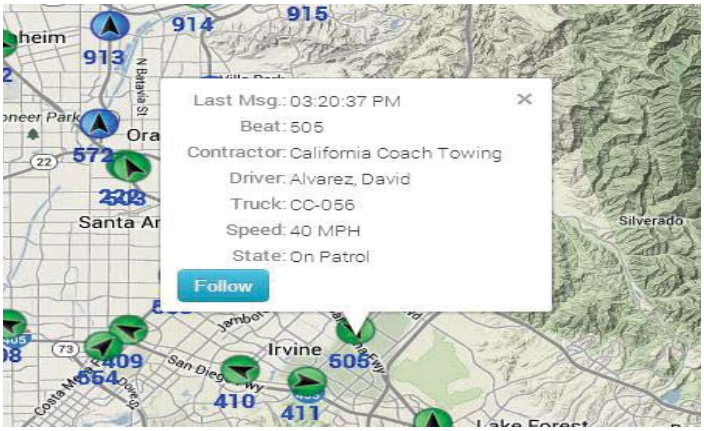
As can be seen, a system operation officer, or manager can answer a drivers question as to a location to drop a vehicle without violating any City's ordinances.

The use of artifact creation can include weather reports, Doppler precipitation reports, or many other useful and informative public information items. Artifacts specific to an individual customer can be configured and included in the Map design at configuration time.

Quick Action Map Use:

Let's go to the main default map and see a quick use of the map and icons on the map. As you know each icon represents the current latitude and longitude location of a vehicle being tracked. Each vehicle and icon has a unique identifier associated with it. As map operators and fleet managers become familiar with these identifiers a very quick method to understand the basic condition of a vehicle can be quickly established.





Simply by clicking on or touching an icon the map will display a data box about that icon. It contains at least what is seen to the left. The "Follow" button can then be clicked or touched. Immediately the zoom function is executed and the map will zoom in on the icon and report updates, in real time, every 10 seconds to the data in the icon data box.

Follow

As seen below this information combined

with map data can be most useful: